SECURITY CHALLENGES IN THE 21ST CENTURY

Edited by
Géza Finszter
István Sabjanics

Dialóg Campus

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Recommendation

"Security can be provided by freedom of thought"

Nowadays, security is among the most frequently mentioned notions and at the same time the most longed for condition, which, however, is very relative. What gives security, or at least a sense of security, varies widely dependent on the individual, their age and their country.

The political tremors in Eastern Europe at the end of the 20th century created the illusion that the current of history was abating and indeed could even come to a halt. Only a few years had to elapse before it transpired that precisely the opposite was true: events that could affect the fate of not only a continent but the whole of humanity are following each other at lightning speed.

A whole series of problems and tasks at a global level need to be addressed. Wars, migrations on a Biblical scale yet with many modern characteristics, social inequalities, climate change, and increasing demands for energy, water and food security put people to the test worldwide on a daily basis. These daunting problems cannot be resolved by improvised means or methods that by-pass scientific thinking. Epidemics cannot be stopped by incantations and the effects of climate change are not lessened by declarations.

In the volume of essays *Security Challenges in the 21st Century,* academics establishing new schools of thought, innovative researchers and practitioners identify problems and outline necessary and potential future actions. Reading the essays confirms once again that science with evidence-based results proven by scientific methods represents a reliable point of reference and a sound basis in the cacophony of the overwhelming information flow around us. Whoever provides the right circumstances for research creates conditions for a more secure future because in the long term security can be provided by freedom of thought.

This increases the value of the role of researchers while at the same time giving them enormous responsibility. Appreciating this responsibility, the Hungarian Academy of Sciences has launched its strategic research programmes which can contribute to bringing modern efficient education, clean water and a clean environment, healthy food, and up-to-date medical facilities and treatments – put simply, security – to as many people in Hungary as possible.

All the authors of the essays in this book strive towards this end. I thank them for their efforts and recommend this volume to everyone who wishes to follow suit in creating security.

László Lovász,
President of the Hungarian Academy of Sciences

Foreword

The decision of the Academic Council of Home Affairs to publish a volume of essays entitled *Security Challenges in the 21st Century* arose from the realization of the responsibility of the Hungarian state to strengthen public order in the country. The main burdens of this responsibility are shouldered by the internal affairs administration and in particular those organizations and services performing law enforcement duties that face dangers threatening our fundamental values, violations showing complete disregard for Hungary's legal system and the challenges of crime on a daily basis.

Approaching the end of the second decade of the 21st century, we can say that we have come a very long way from the period promising world harmony. In the decades of the rise of the middle class in modern Europe, modern law enforcement acquired the ability to deal effectively with violence that destroys order. The European values of material and intellectual culture were created by the best minds, but policing efforts were needed to protect these values. A state providing security still needs such virtues and the monopoly of the authorities is worth refining. In their endeavours to achieve public order and public security, the leaders of the state count on the help of the sciences, through outlining the correct situational picture, presenting a technical achievement or a new initiative, or expressing warning criticism. Research broadens our common knowledge and brings us closer to reaching good decisions.

The Academic Council of Home Affairs deserves to be commended for conceiving and releasing this book. It bespeaks modern thinking, that – besides social sciences –, the tools of natural sciences can also be found among the possible interpretative patterns of security in such important areas as energy security, healthcare and water management. The Ministry of Interior greatly appreciates the support of the Hungarian Academy of Sciences and the achievements of those scientists, researchers and academics who have undertaken to be the authors of this book, thus providing the reader with an exceptional, one-of-a-kind, joint intellectual product. The foresight of the editors is shown by the idea of giving the opportunity to young talented researchers, the scientists of tomorrow to appear in this volume now being launched.

I trust that the colleagues involved in law enforcement administration will find this volume a useful source. I believe the essays will be of help to those carrying out their daily duties, strengthen common thinking of the practitioners of the social and natural sciences, provide intellectual ammunition for secondary and tertiary vocational training in law enforcement, and promote the development of the theory of law enforcement.

Sándor Pintér
Minister of Interior of Hungary

I.

THE IMPORTANCE OF SECURITY IN THE 21ST CENTURY

Péter Tálas

The Changes in International Power Relations and Their Geopolitical Consequences

Péter Tálas PhD, Senior Research Fellow and Honorary Professor; Director of the Centre for Strategic and Defence Studies of the National University of Public Service

Abstract

Through looking back to the transformative processes of the past 25 years, this study outlines the determining characteristics of the current international power relations, predominantly with an analytical approach. It seeks to answer the following questions: how should we approach the analysis of the international system, the changes that have occurred during the past 25 years, and today's power relations? In doing so, the author offers an overview of how international power relations have transformed from the break-up of the bipolar world order to the current multipolar setup; how the concept of power and its elements have evolved; and how the range of influential actors of the international system has broadened, in overall changing the hierarchical structure of the whole system. Finally, the study also offers an analytical picture of the most important characteristics of international relations, identifying where the stakes for Europe and the European Union currently lie, as its course of development is also the primary strategic determinant of the future of Hungary.

Keywords: power relations, international system, demographics, economic power, soft power, military power

From a Bipolar World Order to a Multipolar International System

Over the past 25 years since 1991, the strongest organizational and geopolitical change in international relations was the shift of the *international system* from a bipolar world order to a multipolar one. The bipolar world order was an international system based on the military and ideological confrontation of the two world powers (the United States and the Soviet Union) and their alliance systems (the NATO and the Warsaw Pact, respectively), and was characterized with high risk and high stability in terms of security policy. Being aware of their military parities that were sufficient to destroy each other, the two superpowers with global ambitions and capabilities, i.e., the United States and the Soviet Union, carefully made sure that both themselves and their allies refrained from open military confrontations

and pushed all conflicts to the peripheries, where they did not directly attack each other either, but relied on their proxies to fight the local wars (proxy wars) (Mearsheimer, 2006).

> The *international system* is a system created by nation states, wherein these days not only the governments but also international organizations (e.g., UN, EU, NATO), non-governmental organizations (NGOs), and other non-state actors (e.g., multinational companies, nations without a state, armed organizations and terrorist groups) (may) play a role.

If we intend to divide the 25-year process of the shift from a bipolar to a multi-polar world order into phases, the years of 1989–1991 and the years of 2001 and 2008 were milestones, international events indicating significant changes that made visible the structural changes of the international system.

One of the most significant global political changes of 1989–1991 was the breakdown of the geopolitical blocs. However, with the breakdown of the Warsaw Pact, the Comecon and the Soviet Union, i.e., one of the "disciplinary" poles of the bipolar world order, did not lead to a more stable but to a more unpredictable security environment. It was well indicated by the changes of regime in Central and Eastern Europe and the tectonic movements in a geopolitical sense, one of the key aims and elements of which became the exit from the Soviet bloc and joining the Euro-Atlantic security structure. However, the breakdown of the Soviet Union and its system of allies put a stop to the former strong ideological confrontation and military parity and thereby considerably reduced the possibility and a chance of any direct military confrontation between the great powers (Mearsheimer, 2006: 147–159.). After the fall of the bipolar world order, the world entered a new phase of low risk and low stability in terms of security policy.

At the beginning of the 1990s, bipolarity, which provided a great deal of stability, was replaced by a unipolar world according to many experts (Ikenberry et al., 2011; Magyarics, 2011). In the new geopolitical situation, the United States and the NATO led by the U.S. were left without any competitor and were able to make the Soviet Union and its successor, the Russian Federation, accept their own ideas on the German reunification and arms control without practically any considerable Russian resistance.[1] Washington successfully enlarged NATO with Central and Eastern European states that had left the Soviet Bloc (1999), also including the Baltic countries which are classified as the "near-abroad" of Russia (2004). In those years, there were no countries other than the United States that could be considered a global actor also in terms of military capabilities (Belopolsky, 2009: 14–28.). Other experts and, declaratively, the great powers, talk about a multipolar system even after the fall of the

[1] In relation to arms control in November 1990 the United States and the Soviet Union as well as numerous other European states signed an agreement on the reduction of European conventional weapons. In June 1990, the U.S. and the Soviet Union agreed to maximize their chemical weapon arsenal in 5,000 tonnes, respectively, and to stop their manufacturing. In July 1991, an agreement was reached on the restriction of strategic nuclear weapons (START I). The Chemical Weapons Convention (CWC) was signed in January 1993 and the second agreement on the restriction of strategic nuclear weapons was also signed in the same month of the same year (START II). The Ottawa Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on their Destruction was signed in 1997. Other confidence and security building agreements were also adopted and an agreement on Open Skies was also concluded (N. Rózsa–Péczeli, 2013).

bipolar world order saying that unipolarism in the sense that the United States had been able to enforce its interests and resolve regional conflicts without any military intervention just like during the Cold War, was already shaken by the Iraqi invasion of Kuwait in August 1990 and the First Gulf War that followed (Krauthammer, 2002: 10.). They add that during the ten-year period after 1991 there were no actual international conflicts that affected the direct environment, i.e., fundamental interests of the weakened successor of the former world power (Russia) or the potential world power, China. They therefore agree with Charles Krauthammer, who defined the temporary position of the United States in global policy as a "unipolar moment" in December 1990 (Krauthammer, 1990).

The myth of the unipolar international system proclaiming the international dominance of the United States was finally destroyed on 11 September 2001, when terrorist attacks hit New York and Washington claiming almost 3,000 victims. Although 9/11 is still often referred to as a turning point in political publicity, which fundamentally changed the international system, in fact the tragic event only altered the views of the U.S. and the general public of the world in three important aspects. On the one hand, it became obvious that the United States was not invulnerable either. On the other hand, the world realized that the international system had some non-state actors who were able to significantly influence the behaviour of the major state actors of the system. And thirdly, the wars in Afghanistan and in Iraq revealed the limits of the global military capabilities of the United States. Although it is true that the strongest power of the world was able to establish and maintain extensive military forces and fight wars for many years in Afghanistan and Iraq, it was unable to win those wars despite the primary military successes (overthrowing the political system prevailing until the intervention) or to leave a stable security environment behind (Tierney, 2015; Thompson, 2015). Despite the limits of the American capabilities, the United States is the only actual global power in the current international system that can enforce its global interests with its global tools of power, relying on its global system of allies. The United States is not only the single actual global power but, in view of its other capabilities as a great power, it is also a hegemonic power, i.e. an actor in the international system that is able to most powerfully shape the system (Mowle–Sacko, 2007: 7–15.; Magyarics, 2011).

In the international literature the third milestone in the process of the shift from a bipolar to a multipolar world order was the war between Russia and Georgia in August 2008 (Kagan, 2008: 71.; Papkova, 2011: 48.). Similarly to 9/11, it is not a real milestone either, as the international system did not become multipolar then, but is rather a theoretical turning point. By then the international public was aware that in the post-Soviet area Russia might have much greater capabilities and better opportunities to enforce its interests than the United States or the wider international community. In more general terms: the great powers may have much better opportunities to enforce their interests in their own direct environment, their own regional *security complexes* than a global hegemonic power. The international community also had to face the same in the civil wars of the Middle East that broke out in 2011–2012, or in 2014 during the annexation of the Crimean Peninsula and the breakout of the separatist fights in Eastern Ukraine as well as in relation to the behaviour of China in the island disputes of the South China Sea. All these events indicate that due to the behaviour of the actors of the international system, the current international relations may be described with a certain type of new realism, which will be described in more detail later (Richardson, 2008). This new realism provides more opportunities to the actors of

the system to enforce their interests but it also puts greater responsibility on them in terms of the harmonic operation of the international system.

The *security complex* is a group of states, the main security ideas and problems of which are so much interconnected that their national security problems may not be reasonably analyzed or resolved separately (Buzan et al., 2006: 66.).

In summary, it may also be said that the current international system is specifically multipolar: on the one hand, the United States still has a hegemonic role in the world, but on the other hand, the great powers have much greater influence and better options for enforcing their interests in their own regional security complex than anyone else. This does not mean that there is no hierarchy in the current international system. It only means that this hierarchy cannot always be observed or enforced in the direct vicinity of the regional great powers. It is not possible partly because there are also local actors "under" the global hegemon and regional great powers who may also become main actors in a sub-system, although such a role is usually temporary. It is enough to refer to Al-Qaeda that committed the terrorist attacks in 2001 or the so-called "Islamic State" in relation to the Syrian civil war. These terrorist organizations, originally consisting of a few hundred members, were and are capable of taking actions that determine international relations for years and become influential actors in the international system in just a few years. Their example is also important in terms of studying the international relations because it also highlights a much more general problem. Namely that while analyzing or observing international conflicts or processes, we must take into account the interests and actions of many actors. Not only those who are traditionally known as global actors, but also of regional and local actors.

Although the states that have legal entity continue to be the most important actors of the international system, they are not at all the exclusive constituents of the system. In addition, in the literature the actors of the international system are generally divided into sub-state and supra-national groups. While the sub-state group contains nations and minorities (e.g., Kurds, Basques), various international groups (e.g., non-governmental organizations, terrorist organizations) and the individuals, the supra-national category includes federations, international organizations with legal entity (UN, NATO, EU) and other groups organized at the level of the international system (e.g., G7, G8, G20).

Sources and components of international power in the 21st century

The hierarchy of the international system is primarily determined by the power capabilities of its actors, their related behaviour and mutual interdependence. This latter has clearly gained strength following the fall of the bipolar world order,[2] with the relations conducted on increasingly strong channels between societies and with the more intensive and accelerating globalization in the form of the flow of information, transport, finances and economy

[2] Let us just think of the globalization of financial markets, the expansion of transnational and multinational companies, the accelerated flow of information and the increasingly unimpeded flow of the four freedoms.

(Gartzke et al., 2001: 393–397.; Rana, 2015), even despite the fact that, parallel with these processes, fragmentation and localization are also present in the international system (Biermann et al., 2009; Zürn–Faude, 2013: 123–125.; Hines, 2007). Before moving on to the presentation of the sources and components of international power in the 21st century, it must be stated that defining "international power" is extremely difficult and disputed considering the permanent change and diffuse interpretation of this concept (Morgenthau, 1978: 4–15.; Nye, 2011: 5–10.; Cammack, 2008).

In this paper, the term "international power" refers to a situation when one actor of the international system is able to influence others (Nye, 2004a: 1–2.), and we will discuss only those sources and components of power, in relation to the importance of which there is consensus among experts. In this regard we must talk about *economic, diplomatic, cultural* and *military* aspects of power as parts of the definition. In addition, we must also discuss their components, such as demography and military capabilities recognized as *"hard power"*, economic performance and development, which is also referred to as *hard power* by certain analysts or as intermediary elements by others, as well as diplomacy and model value, which is generally described as *"soft power"* (Cammack, 2008: 6.).

Economic power means influencing others with economic tools and the ability of exerting such influence to make others be more economically dependent on us than we depend on others. Such areas include resources, absolutely necessary for life (basic foodstuffs and potable water) and control over the key factors of economy (capital, energy and energy sources, industrial raw materials, industrial capacity, technology, trained workforce and market). When economic interests are enforced in the form of sanctions or embargoes, it is the power of compulsion, but when it takes the form of an attractive business model or approach or a pattern induced by economic welfare, it is clearly the power of attraction. Economic power is in close correlation with military power, especially in the 21st century (Nye, 2011: 74–86.; Szörényi, 2009: 149–150.).

Diplomatic power means the ability of influencing the behaviour of others with diplomatic tools in order to make them co-operative in achieving the goals of our own foreign policy. Diplomatic power may be applied in bilateral relations, in multilateral relations and through international organizations. *Public diplomacy* is an important tool of diplomatic power in the 21st century, within the framework of which states try to inform, influence and convince the general public of other countries in order to attain their own foreign policy objectives (Van Ham, 2005; Nye, 2008).

Cultural power means influencing the behaviour of others through the widely interpreted cultural attraction and social model value or having the ability to exert such influence to attain preferred foreign policy objectives.

Military power means influencing the behaviour of others by using or threatening with armed forces. The essence of the use of armed violence is to make an impact on the behaviour of others rather than causing a loss or damage with violence. The desired effect is achieved by projecting further violence, associated with the assurance that violence can be avoided if the will of the party using power is accomplished. Of the military power functions, deterrence and compulsion has an effect on the intentions of the enemy. Defence is aimed at the capabilities and not the intentions of the enemy: the objective of deterrence is to make the enemy refrain from action, while the purpose of defence is to resist action (Schelling, 1966: 3–4., 78–79.; Snyder, 1975: 3.).

The role and importance of the states in the international system are determined by their economic, diplomatic, cultural and military capabilities and the efficiency at which they can use these to shape the system, as well as the extent to which they can compensate for the capabilities they are lacking. However, in terms of analytical aspects, two things should be taken into account. On the one hand, capabilities also strongly influence the approach towards the international system: those who are strong in a military sense, represent military power, those who are strong economically, represent economic power and those who do not have such powers, stress the importance of *soft power*. On the other hand, although according to most analyses the military power classified as *hard power* is put in first place during the assessment of the power relations of the international system, in reality and in practice economy, politics and widely interpreted culture (model value) as power tools always exceed military power. It is so not only because in general everyone looks at military power as the final resort, but mainly because without a strong economy no state can have a strong army.

Demographic trends

Among the components of international power, we must first discuss demography, because the power of each nation stems from its residents and citizens. Under identical circumstances, nations that have a large population in general are not afraid of nations that have a small population, those who produce effectively are not afraid of those who work less effectively, and the international system has always preferred effective nations with large population in the long run. A large population, coupled with advanced modernism, means a lot of reproduced workforce, a strong economy, significant political influence, a large and strong army, i.e., considerable international power and prestige.

However, as it is generally known, demographic inequalities and extremes can predominantly influence power capabilities not only in the underdeveloped but also in the modern societies. By these days, the demographic challenges of over-population, diminishing population and ageing society and their consequences, such as the shortage of food, agricultural degradation of the natural environment, environmental pollution, the shortage of fresh water, accelerated urbanization and migration have become standard components of globalization challenges and strategic analyses. For the purposes of the subject matter of this study, it is a clear message of the latter that even the actors of the international system look at the transformation of the demographic relations as a factor that significantly influences the global importance of individual countries, naturally not on an exclusive basis and generally in the medium and long term.

According to the UN demographic projections, the global population will continue to grow in the 21st century, although at a slower pace than in the past, and will reach 11.21 billion by the end of the century (UN, 2015: 1.). Looking at the demographic trends by regions, a different future vision opens up that can significantly influence the power relations and hierarchy of the international system.

Table 1

Demographic changes in the regions and in a few states of the world, 2015–2100

	Population (million people)			
	2015	**2030**	**2050**	**2100**
World	*7.349*	*8.501*	*9.725*	*11.213*
Africa	*1.186*	*1.679*	*2.478*	*4.387*
Angola	25	39	65	138
South Africa	54	60	65	65
Ethiopia	99	138	188	242
Democratic Republic of the Congo	77	120	195	388
Nigeria	185	262	398	752
Sudan	40	56	80	127

	Population (million people)			
	2015	**2030**	**2050**	**2100**
Asia	*4.393*	*4.923*	*5.267*	*4.889*
China	1.376	1.415	1.348	1.004
India	1.311	1.527	1.705	1.659
Japan	126	120	107	83
South America	*634*	*721*	*784*	*721*
Argentine	43	49	55	58
Brazil	207	228	238	200
North America	*358*	*396*	*433*	*500*
United States	321	355	388	450
Canada	35	40	44	49
Mexico	127	148	163	148
Europe	*738*	*734*	*707*	*646*
United Kingdom	64	70	75	82
France	64	68	71	75
Germany	88	79	74	63
Eastern Europe	292	278	251	208
Russia	143	138	128	117
Hungary	9.8	9.2	8.3	6.5
Oceania	*39*	*47*	*57*	*71*

Note: Eastern Europe = Bulgaria, Czech Republic, Byelorussia, Poland, Hungary, Moldova, Russia, Romania, Slovakia, the Ukraine.

Source: UN, 2015

Of the large regions of the world, *Africa* is the only continent that faces a population boom at the beginning of the 21st century. The population of the continent will increase by 493 million by 2030, and by 1.29 billion by 2050 compared to the current figure, while, by the end of the century, the present figure of 1.18 billion will increase to 4.38 billion, meaning 3.5 times of what it is now. The key issue to the future of Africa and the regions close to it is whether this huge increase in population can be matched with sustaining and preserving capabilities of the continent, mostly affected by global climate change. Will African countries transform into states that offer more secure living and a more promising life to their citizens? If his is the case, then due to a few African states the continent may join the international arena as more active and influential actors (Cornelissen et al., 2012: 194–197.). If it does not happen, and that scenario seems more likely at the moment unless external assistance becomes available, Africa will face permanent conflicts, increasing security policy challenges and risks e.g., by becoming the largest source of international migration in the 21st century. With such a population increase, migration will be a major challenge simply by its volume. If, following the current global trends, 3% of the population of Africa decided

to leave their homes, by 2030 15 million, between 2030 and 2050 24 million, and between 2050 and 2100 57 million people would leave their homes.[3]

According to the projections, the currently significantly slower increase of the *Asian* population will turn into a decline by 2050 (when the population reaches 5.26 billion) and by the end of the century the continent will only have 4.88 billion inhabitants. Following China and South Korea, after 2030, at approximately the middle of the century, India and Indonesia will face the problems of declining population that Japan and Europe have been facing for years: ageing society, known as super-aged society (when the population over the age of 65 reaches 20%), a declining group of active workers, decreasing economic growth and risks related to the stability of social welfare systems (UN, 2015: 33–37.). In addition, in Pakistan, China and India, where male children *are valued more* by families, a considerable and durable shift may be expected in the proportion of men and women (Bauer, 2015).

As Table 1 indicates, in the 21st century *South America* will follow a demographic course similar to that of Asia: its population will grow until the middle of the century but then it will decline more intensively (8%) than the population of Asia (7%). The question there is the same as in most regions facing a decline in their population: can the continent become attractive enough the period of the growing population to encourage inhabitants of other regions of the world to immigrate?

Apart from Africa and Oceania, *North America* is the continent, where the population is likely to grow in the 21st century partly and primarily due to immigration and partly due to the (relatively) low productivity rate (2.06). However, as a result of immigration, the continent should expect changes in the set of social values and the conflicts that accompany such changes (McElvein, 2016). The management of those conflicts may be made easier because, according to most projections, the immigrants expand the economy of the United States both at present and in the medium term by not taking jobs from the local residents born there (Card–Peri, 2016; Brookings, 2016).

Europe, which is the most important continent for Hungary, is already in a demographic downturn and will face further significant population decrease in the 21st century. Although until 2030 the overall population decline of the continent is only projected at 0.5% and until 2050 at 4.7%, by the end of the century it may reach 12.4% (–92 million inhabitants), which is the highest among the regions experiencing a decrease in their population. If Europe does not replace part of its diminishing population with immigrants, the decline of population will have similar, but more painful consequences for our continent than for Asia.[4] Our immediate region, defined as Eastern Europe in the UN database, will face even more dramatic demographic changes in the future, as its population may diminish by 4.7% by 2030, 14% by 2050 and by even 28% by the end of the century if the current trends will be sustained. The two main reasons for the decline of population in our region is the rather low fertility rate (around 1.4) of the countries of the region and emigration to Western Europe, the pace of which will only accelerate in the future if Europe does not accept any immigrants.

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[3] According to the data of the International Migration Organization, in 2014, 3.2% of the global population, i.e., 235 million people were migrants.

[4] In social and political aspects, primarily not poverty but rather much more the impoverishment process of the middle class and the subjective perception thereof as well as the increasing polarization of the income relations of society may cause problems.

Although, as indicated above, the demographic features and processes themselves do not determine the place or importance of a state in the international system, it seems likely that the regions and states losing their population the most, will also lose some of their influence, while states with increasing population can increase their influence if they can simultaneously also increase their economic, social and political capabilities.

On the components of economic power

The United States could win the Cold War because it had a stronger economy and greater economic power than the Soviet Union. As the Soviet Union was unable to become an economic competitor of the United States or to present a lasting model to its allies, the Soviet Union practically remained unidimensional in terms of power, i.e., the two global powers were in parity only in military aspects between 1945 and 1991 (Magyarics, 2009: 26.). Therefore when in 1991 the military power was pushed into the background in international relations with the fall of the Soviet Union and the cease of the Warsaw Pact, the United States apparently gained a very good position by winning in two fields (military and economic) as it beat the Soviet bloc with its economic power.

However, contrary to the Eastern bloc, the Western alliance had a diversified background already during the Cold War. It could rely on military-defence co-operation (NATO) and on the bargain among the constituent powers whereby the United States helped economic recovery, consolidated and strengthened, for example assisted the powers within its scope of interests, especially Germany and Japan, in attaining the position of an economic great power in exchange for the recognition of the hegemony of the U.S. in the West. In Western Europe, it also supported economic integration and the establishment of the European Union. However, after 1991, when the significance of military power decreased in the changed security environment, these countries became competitors of the United States in economic power. On top of everything, the Deng Xiaoping reforms in China practically matured by the same time, as a result of which China, having the size of an empire, became the second largest economy in the world in a short time, and has grown into the largest economy by now. A number of other Asian countries, including Taiwan, South Korea, Hong Kong, Singapore and Indonesia, have also achieved similar spectacular development. Brazil in South America, Saudi Arabia and the Gulf States in the Middle East and Nigeria in Africa should also be mentioned as countries achieving significant economic progress. Over the past 25 years, an increasing number of countries shared power within the international economy and states have also become global or regional economic competitors of the United States which, contrary to Western Europe or Japan, did not fall within the influence of the U.S. hegemony directly. The role of the U.S. in their economic success was and still is limited to the fact that primarily Washington provides access to energy sources (Middle East oil) and to some of the raw materials for them and guarantees the security of some trading routes (e.g., Strait of Malacca) (Magyarics, 2009: 27.).

Although even the general public interested in politics associate economic power with the value of the gross domestic product (GDP), which is the goods (products and services) produced for final consumption during a particular period, in reality the power ranking can be established in a much more complex manner, by taking into account numerous other

factors. Besides economic experts, more and more politicians have pointed out the same since the 2008-2009 financial and global economic crisis. It is because although China is already ahead of the United States in terms of GDP measured at consumption power parity, the productivity, efficiency and innovative ability of the U.S. economy is still far greater than those of the Chinese economy. While in China 1.3 billion people produce the gross domestic product under the conditions of state-controlled capitalism, in the U.S., where there is full and open market economy, only 321 million people do the same. This shows that the productivity of the national economy is rather important regarding the rankings of international economic power, in relation to which not many conclusions can be drawn from a ranking established based only on GDP. Productivity depends on three fundamental factors (which should also be taken into account in an analysis): the amount of capital assets and liabilities of a particular country and how effectively it can use them; the trained work force, i.e., the quality of work produced by employees; and the level of the advanced technology used in production, i.e., the effectiveness with which automated workforce can supplement the human workforce. These are only factors of production, while finances (the role played in the international financial activities and the financial system of the world), foreign trade (the share in global trade), or the available economic resources (energy sources, raw materials, natural resources) have not even been mentioned, although they can also significantly influence the international economic power of a state. Besides the traditional factors, further aspects should also be taken into account, such as the structure of the economy (ratio of high or low added production value), the quality of the consumed products (instead of the simple quantitative approach), the quality of non-market and therefore non-priced or non-measurable services (education, health), the distribution of income and wealth or social aspects, as well as quality of life and sustainability. Consequently, various power rankings consisting of various relevant indicators may be prepared (Stiglitz et al., 2009).

We need to see though that the power acquired cannot always be transformed into actual influence on its own because international economic relations are extremely complex, where the economic or economically useful natural resources, the ownership of development tools and capacities represent only one component of power. Another component is the position held in terms of influencing economic decisions and the execution and control of those decisions, i.e., the hierarchy within international economic processes. The third factor is the relations and a state's position in the international distribution of labour, and finally there are also the aspects of international income distribution and income re-distribution, which are determined by the three components listed above and which also strongly determine to what extent the power acquired by a particular state can be transformed into influence (Szentes, 2005: 30.).

According to most experts, in relation to the economic power of the public actors of the international system, the relative weakening of the positions of the United States was clearly the most important process of the last 25 years (Zakaria, 2011: 15–18.; Nye, 2015: 72–76.). Although according to most analysts it is still the U.S. that has the strongest economy that determines the global economy, but its former advantages have been reduced in almost all areas of the economy primarily because of the rise of its competitors. We must underline that the weakening is relative. It is partly because the "lost volume" of that power is divided among a number of actors (although only China is a potential serious competitor for the U.S.). The other reason is that globalization, which was the strongest in the flow of

information and finances, also affected other areas of the economy and established strong mutual dependencies in the global economy over the last 25 years that made the ordinary operation of the system the key interest for all main actors. It significantly limits the options and intentions of the emerging economies to sustain or enhance economic power conflicts between each other on a durable basis. It does not prevent opportunities of shaping and influencing each other through their economic power (Mastanduno, 2011: 175–176.), in which the U.S. has more experience than anyone else.

Finally, we must not overlook the fact either that there are number of non-state actors in the world economy (e.g., multi- and transnational companies[5] and strengthening integration organizations) which themselves have increasing economic power and they are not necessarily in line with the national efforts or the national attempts of the great powers. Market globalization, the borderless organization of production and sales, the appearance and strengthening of multinational, transnational and globally integrated companies called for managing economic issues at international level, to which all actors must adapt. It is not accidental that in relation to economic power most analysts see the successful future in economic integration. Integration means the distribution of power among the actors.

The current significance of the components of soft power

Even though the term *soft power* reflects upon *hard power,* based on its substance, it would be better to use the term "power of attraction" (Szörényi, 2009: 148.). Joseph Nye, who coined the term at the beginning of the 1990s included the types of behaviour, tools and policies that may influence the behaviour of another party through value-based attraction, encouraging the other party to accept its goals voluntarily, without any compelling force (Nye, 2004a: 5–11.). These days hardly anyone questions that power is exercised with such components; the only subject of the dispute is whether *soft power* itself can result in power or an increasing power or it can only be effective as *"soft power"*, combined with the tools of *hard power* (Nye, 2010).

Soft power may stem from a number of sources: the culture of a country, attractive to others, the values of politics worthy of following, or foreign policy with moral authority (Nye, 2004a: 11.). In fact, in certain situations, military and economic power (liberation, peacekeeping, aid and support) can also function as the tools of *soft power*, although both are referred to in the literature as compelling, *hard power* type power tools. In recent years the experts examining international relations have tried to measure the capabilities of the states within the scope of *soft power*, taking into account the objective and subjective components of that type of power. While the former is associated with the quality of public administration, the dissemination of information technology, culture, business atmosphere, education, the size of diplomatic network and the intensity of involvement in

[5] Multinational companies are jointly owned companies with shareholders of different nationalities. However, the different ownership is not directly affected in the operation of the company, i.e., the control and business policy of the company is consistent and profit-oriented, just like in any single-nationality joint-stock company. Transnational companies, however, are joint-stock companies, which do not only simultaneously operate in a number of national economies through their subsidiaries and contractors, but also have multinational capital ownership.

global problems, the latter includes less quantifiable factors, such as the popularity of the culinary culture and produced technical and luxury items of a given country, the level of welfare, or the hospitality of the local residents or the importance of the country in terms of foreign policy (McClory, 2016: 18–23.). In this paper we only focus briefly on the two major elements and areas of *soft power* which these days have the greatest impact on power relations: diplomacy and model value.

Looking at the actors of the international system, from the point of diplomatic power capability, it is easy to realize a few things. On the one hand, it is easy to see that the possibility of enforcing power is closely related to *belonging to international organizations* (the success of pursuing the interest of each state predominantly depends on its international integration), and, on the other hand, that influence is closely related to the status within the organization. As under international law after WW2 the greatest international power relating to peace and security was vested in the permanent members of the UN Security Council, the SC members are the strongest actors of the international system based on that status, irrespective of their actual power capabilities. They make binding and executable decisions with consensus (even on the use of violence), may set priorities for the agenda of international relations (by pushing events into the foreground or to the background) or may block decisions that are detrimental for them or for their allies with their veto. At the bottom of the hierarchy are those countries who only have an observer status in the global organization (e.g., Palestine) but even based on that they can take part in the activities of a number of specialized UN organizations, including the International Court of Arbitration. Besides, it is not difficult to see either that if we accept that international organizations represent the norms of the international community, the integration and international recognition of a country is closely related to its attitude to the norms and its norm-compliant behaviour. In general, being a member of an internationally integrated organization, the status obtained in the organization and any earned prestige are important for all members of the international system, even for the great powers that occasionally avoid the SC. For the small states representing the majority of the international community, it is clearly of key importance because often such multilateral organizations are the only source of their diplomatic power.

Cultural diplomacy, which intends to make another state committed to its own interests by presenting and making attractive the widely interpreted cultural values of the particular state (art, science, education, philosophy of life, etc.), is an increasingly important element of *soft power*. The significance of this area is clearly indicated by the fact that some states maintain a whole network of cultural institutions across the world to disseminate and promote their language and culture. Table 2 shows well the states that prefer cultural diplomacy (in general *soft power*) and the regions towards which that tool of power is applied. Another information ideal for orientation is that most cultural institutes operate in the United States (107), Germany (59), India (45), the United Kingdom (40), Italy (37), France (37), Spain (36), China (33) and in Russia (33).

Table 2

Number of cultural institutes of those countries that have the largest network of international cultural institutions in the world, across various regions of the world

Country	Cultural institute	World	Europe	MENA	Asia	Africa	America
China	Confucius Institute	332	107	9	84	18	103
France	French Institute	229	82	54	43	37	13
UK	British Council	196	67	33	53	26	17
Germany	Goethe Institute	159	71	16	33	15	24
Italy	Institute of Italian Culture	92	49	10	11	3	19
Russia	Cultural Centre of Russia	82	52	2	24	0	4
Spain	Cervantes Institute	78	39	15	9	1	14
Portugal	Camões Institute	67	31	3	8	18	7
India	Cultural Institute of India	57	6	3	39	4	6
Japan	Japan Foundation	26	7	1	13	0	5
South Korea	Cultural Centre of Korea	25	8	0	11	1	5
Brazil	Cultural Centre of Brazil	24	5	0	0	2	17

Source: British Council, 2012

Over the last 25 years, *public diplomacy* has been one of the most robustly developing fields of diplomatic power. Originally public diplomacy referred to the communication activity of governments with which the leaders of the particular country intended to influence the foreign and domestic public, and primarily the elite that had a direct impact on political decisions in support of their own foreign policy objectives. However, with the restructuring of publicity and the development of communication tools, i.e., appearance of the internet and social media, public diplomacy has transformed significantly and the public opinion expanded with the influence of those who had an indirect impact on political decisions. The number of parties taking part in such activities also increased significantly because these days besides governments, scientific institutions, political, strategic research centres, non-governmental organizations (NGOs), transnational companies and also terrorist groups use this tool of international influence.

The extent to which the social, political and economic structure of a particular state is attractive *(represent a model)* and the popularity of its political views and values internationally is an important element of *soft power*. We must talk about this area briefly because, according to numerous analysts over the 25 years following the end of the Cold War and especially during the years after the start of the 2003 Iraq war, the Western states promoting the values of democracy and liberal market economy also suffered significant losses in this respect (Nye, 2004b; Magyarics, 2009: 19–25.; Cox, 2012; Oualaalou,

2016). Stating it differently: contrary to the famous projections of Francis Fukuyama, the global victory of liberal democracy never occurred (Fukuyama, 1989: 3–18.). Although it is a hardly disputable fact, it does not represent a new "decline of the West". Although it is true that the export of democracy with the tools of *hard power* (Iraq, Afghanistan) and the double standards applied towards autocratic regimes (support to one and overthrowing others) weakened the authority of Western democracies in numerous regions of the world, the 2008 financial and economic crisis also destroyed the reputation of the liberal market economy; and it is also obvious that communism was not the only challenger of the social model of the liberal democratic market economy. If we look around, we can see a large group of alternatives, which all acted and still act against the Western model as competitors. They include the Russian "sovereign democracy", the successful "state capitalism" of some Asian countries, the "communist capitalism" of China and the Islamic societies built on norms different from the Western set of values (Magyarics, 2011: 31.). However, it is likely that it is a natural situation. What is more, most of these structures emerged independently from the liberal democratic market economy model. Taking all these into account, it is perhaps more accurate to talk about an expected or desired victory that never happened instead of a loss. It is even more so because in most international assessments and lists that classify the states on the basis of their abilities within the scope of *soft power*, Western European countries and the United States are still in leading positions (McClory, 2016). In relation to the position of the European countries in this order, we can also draw another conclusion: in the successful application of *soft power* from among the components of international power, even the medium-sized and small countries (e.g., Switzerland, Sweden, Denmark) can easily beat much greater powers (e.g., Japan, Italy, China, Russia) (McClory, 2010; 2015; 2016).

Change in the role of the military power

Following the fall of the bipolar world order, military power has changed most spectacularly among the components of international power. With the fall of the Soviet Union and the Warsaw Pact, the security environment, the nature of conflicts have changed, the concept of battlefield has expanded and the military sector and the military forces tried to adapt to them.

In relation to the security environment, the general public of the world experienced the breakdown of the bipolar world order as the disappearance of potential military conflicts between the military blocks and a decrease in the threat and probability of wars between great powers and in general between states. Looking back to the past twenty five years, most probably many questioned that trend, because at least 16 armed conflicts, officially referred to as international wars, have occurred.[6] However, it is important to see that the majority of those were of limited extent and intensity, most of them related to border disputes or civil

[6] Invasion of Kuwait by Iraq (1990), First Gulf War, (1990–1991), Armenian–Azeri war for Karabakh (1994), Peru-Ecuador border war (1995), NATO–Yugoslavia war (1999), Ethiopia–Eritrea war (1998–2000), Kargil war between India and Pakistan (1999), Six-day war between Rwanda and Uganda (2000), Bangladesh–India border war (2001), War in Afghanistan (2001–2014), Spanish–Moroccan war for Isla del Perejil (2002), Iraq war (2003–2011), Cambodia–Thai border war (2008–2012), Djibouti–Eritrea border war (2008), Russo–Georgian war (2008), Annexation of Crimea by Russia (2014).

wars and, in fact, only the first Gulf War in 1990 and 1991, the NATO–Yugoslavia war in 1999, the war in Afghanistan of 2001–2014, the Iraq war of 2003–2011 and the Russo–Georgian war of 2008 may all be described as classic wars between states. However, the latter were launched, conducted by the great powers or they played a main role in them (United States, Russia) often based on international authorization or in international coalition (First Gulf War, NATO–Yugoslavia war, war in Afghanistan), in which cases they were certain that the conflict would not escalate. These wars did not question the general U.S. and European perception of the reduction of the threat of major armed conflicts referred to above, as a result of which other dimensions of security, previously pushed to the background (economic, environmental, societal), became important for societies.

This did not mean any major reduction in the number of armed conflicts, only that intrastate conflicts and the lower intensity civil wars with less military threat to international security took the form of national-ethnic conflicts. Occasionally even they may entail serious economic and societal security risks and consequences, including the increasing prices of energy sources and raw materials, reduction of trade relations, mass migration, terrorism; but in most cases handling the consequences is not the responsibility of the military sector. In civil wars and national-ethnic conflicts non-state security policy actors took the main roles besides the state power (extremist groups, paramilitary organization, separatists, terrorists, international criminal organizations, war lords, etc.) supported and equipped with weapons by a great power from the background either directly or by intermediaries. Even the local power often used "private armies" against them blurring the borderline between civilian and military security (Szenes, 2015).

After the end of the Cold War, the defence expenditures of the world were decreasing for ten years (between 1988 and 1998) and then began to rise again between 1999 and 2012 and have been stagnated ever since (Sipri, 2016). The initial decline was affected by three main factors: the economic crisis of the countries of the former Soviet bloc, more specifically of Russia, the disappearance of the need for and reduction of mass armies and the fact that the NATO member states used the former resources of defence budgets for welfare expenses in the initial period of the détente (peace dividend). As following the fall of the bipolar world order the significance of territorial defence, that was crucial during the Cold War, has decreased significantly even though armed conflicts remained, the nature of armed conflicts changed and there was no need for the mass armies established after 1945 demanding a huge amount of resources any more. The smaller armed forces replacing them demanded fewer, more advanced weapons and systems, operated with better trained soldiers. However, the advanced weapons were more expensive, partly because during their development the armed forces had to follow the rapidly changing technological development of the world that radically shortened development and purchasing cycles (from 20 to 5 years), and there was a spectacular shift in the ratio of knowledge and material content towards the more expensive knowledge content (80% knowledge, 20% materials) (Várhegyi–Vass, 2007: 4.). The change occurred partly because armies were only able to obtain better trained soldiers if they at least tried to offer wages and benefits that kept pace with earnings outside the military sector. These were the main factors that explained the repeated rise in defence expenditures. It was an additional fact that the regional great powers also tried to follow the increase in the U.S. defence budget that accompanied the wars in Afghanistan and Iraq.

Finally, in relation to the transformation of the military power, we must definitely indicate that over the past 25 years the battlefield and nature of armed conflicts have also extended and changed. In addition to the traditional land, air, maritime and spatial battlefields, a cyber battlefield also emerged. This includes cyber-attacks and defence operations that are conducted against the enemies using computer and network devices (Haig–Várhegyi, 2005: 197–244.; Berzsenyi, 2015). As over the past 25 years the weak and *fragile states* became one of the main problems of international security, the armed forces had to take part in intervention operations, peacekeeping and stabilization missions where the mixture of modern and post-modern, as well as post-modern and pre-modern wars could be observed (Resperger et al., 2013: 13–93.).

In summary we can say that if we intend to evaluate the rankings of the actors of the international system in terms of the military component of international power, then those states are on the top of the list that spend significant resources on their armies, supplying them with the most advanced weapons, adequate as a deterrent and matching the nature of conflicts, and are capable of deploying their forces in every part of the world. Naturally, most of such rankings are topped by the nuclear great powers (GFP, 2016). Even despite the general and increasing consensus on the rigorosity of the international nuclear regime prohibiting its use, the nuclear weapon has remained one of the most important tools of a great power even after the Cold War (this is why some states intend to have it). All rankings of nuclear great powers are clearly led by the United States, which is so much ahead of its competitors in the development of military capabilities and military forces that by now a true gap has developed between the U.S. and its European NATO allies in terms of capabilities, which often also imposes a challenge to the success of joint operations. These days the American armed forces are the only army that can deploy troops from the territory of the United States to remote locations, maintain them there for a long time and conduct two wars simultaneously. In general, Russia is in second place, also spending vast resources on the development of its military forces during the presidency of Vladimir Putin and, compared to the Western powers that reduced their military expenses for a while due to the 2008 financial and economic crisis, continued to support the Russian military sector even after the start of the crisis. China is in third place: the country began to develop its military capabilities to match its demographic features and economic capabilities over the past 25 years, developing an army that matches a regional great power with global economic ambitions. The medallists are usually followed by Great Britain and France, who in a number of areas – including the modernization of certain weapon systems – beat even Russia and China, but the size of their army is much smaller than that of those countries. A number of regional powers have also made significant progress in their military capabilities, the military ambitions of which do not extend beyond their own region. These are India in South Asia, which began to progress in a similar way as China and India's peer competitor, Pakistan; as well as Japan, Indonesia, South Korea and Taiwan in East Asia which began to respond to the Chinese military modernization; while such actors include Israel, Saudi Arabia and Turkey in the Middle East. Furthermore, the countries that are situated in a conflict zone or are also parties to a conflict also belong to this category.

The actors and characteristics of the international system

The power structure of the current international system can be described on the basis of the assessment of the components of international power described above. The *United States* continues to be the only truly *global great power.* The U.S. tops all lists of components of international power: it still has the strongest economy in the world (even though it has lost some of its former advantage over the past 25 years), it is the main actor in the international financial system and its leading position in military power is non-questionable. In terms of its international position, it is of key importance that its military capabilities are determining not only in its direct region but in three other regions (Europe, Middle East, Pacific Ocean and Eastern Asia) as well, and that it is capable of deploying military force to any point in the world. This factor also puts it into a leading position among the permanent members of the UN SC. Although the dissemination of its political views and values is strongly criticized, the U.S. has always been able to maintain the relative advantage of the popularity of its social, political and economic structure over its competitors.

The United States are followed by *great powers* in the international power hierarchy that are not only dominant and interactive main actors in the power relations of their direct region but also have global capabilities in one or more areas of international power. From those countries *China* should be mentioned first, which now lies in second place in the order of international power based on its demographic characteristics, growing economic performance and diplomatic power. In addition, the United States looks at China as the only reasonable future challenger for the position of the global leading power. It is a fundamentally favourable aspect of this strong great power, restricted within strong strategic and geographic barriers and practically focusing on the South China Sea that the global middle class of the world, the size of which is currently estimated at 2 billion and is expected to be doubled over the next few decades, will emerge in Asia (Pezzini, 2012). The estimated resource demand and environmental impact of the dynamic Chinese and Asian development will at the same time pose a serious global challenge.

The *European Union* is also considered to be one of the great powers in the rankings referred to above. The EU currently has the second largest economic performance behind the U.S. and its diplomatic power is also significant. In terms of model value, it is even ahead of America. At the same time, in military aspects the EU is unable to behave as a great power partly due to the lack of internal political unity and certain capabilities and in fact during the past few years it has not been able to favourably influence or shape its direct security environment either (Csiki, 2014: 48–51.). Europe's specific international power position primarily stems from the fact that the European Union is not yet a classical great power, while the largest European powers (United Kingdom, France and Germany) are no longer global great powers in the classical sense of the world despite their economic performance, military capabilities or diplomatic positions. Or at least they are not states that could individually compete successfully against the United States or China. In addition, as indicated earlier, the demographic trends also suggest the future weakening of Europe.

From the aspect of demography, *Russia* is in a more dramatic situation than Europe, and in addition to its military capabilities and international diplomatic position, it is kept among the large powers by its fossil fuel resources. The demographic decline is also a major challenge for *Japan*, for which the great power status is guaranteed by its economic perfor-

mance and its close alliance with the United States. One of the most important questions for Russia is whether it can modernize or it will remain stuck with the status of a "one-pillar energy great power" economically (Sz. Bíró, 2014: 42.).

Within international power rankings the great powers indicated above are followed by *regional powers* that are the main actors in their own regions based on their economic, political and military powers and are also individually capable of extending their power to other nearby regions (Buzan, 2004: 71.). Such states are India, Pakistan and Australia in Asia, Iran, Israel, Turkey and Saudi Arabia in the Middle East, the Republic of South Africa in Africa and Brazil in South America. Due to their increasing capabilities, experts consider a few of them as potential great powers.

The next category in international power rankings is the group of *middle powers*, which share the main characteristics that individually they are not capable of impacting the whole international system, only as a group of states or through international organizations, yet they may be dominant actors in their own regions with significant extra-regional activity in a particular segment of international power. It is also important to note that the term "middle power" is difficult to define because the local value of a middle power significantly depends on which region of the world it exists in; on the power potential of the whole region, its prevailing internal relations, the degree of structuralizing in the region, etc. This partly explains why Australia, Canada and Sweden are classified as middle powers similarly to Argentine or Malaysia (Jordaan**,** 2003: 165–171.).

At the bottom of the ranking of international power are the *small states*, which in general do not have any significant influence on the whole international system either on their own or as a group. They have limited individual international power competences and abilities. Their competence usually extends to a particular sub-system of the international system or to their own direct environment, if provided that it is not questioned by the great powers. However, it is important to note that the small state category is not associated with the size of the territory or population of a country (if it was the case, Israel could not be one of the regional powers of the Middle East) but fundamentally depends on the capabilities, performance and international behaviour of the country. In relation to the latter we must also be able to see that small states can improve their international positions mostly through diplomatic power (membership in an organization, alliance, conforming with international norms) and when they can exploit their geopolitical features efficiently (Reiter–Gaertner, 2001). In relation to the small states it should also be noted that the international system and its power relations are dynamically changing, which allows for the change of statuses of the actors in the rankings of power, in general and mostly organically, or sometimes even within a relatively short period. Naturally, it does not mean that a small state or a middle power could turn into a global power but a small state may obtain some power potential, which is generally typical for middle powers and the other way round, a middle power could show the characteristics of a small state within the international system.

During the 25 years since the fall of the bipolar system, we have witnessed two major processes in international power relations that fundamentally determine the current international system. On the one hand, the power vacuum that followed the breakdown of the Soviet Union was filled by new emerging large powers and regional great powers, primarily from the rapidly developing Asian region *(power transition),* and, as a result of the global information resolution, not only the state actors of the international system, but also non-

state actors gained international power, thus some *power diffusion* occurred (Nye, 2011: xv–xvi). The globalization, lower cost and free flow of information and communication gave an opportunity also to non-state actors to intervene and join global politics independently from states. Thus the current international order is not only horizontally multipolar (at the level of states), it is also vertically segmented due to the appearance of the supra- and sub-state actors. This structure of power relations is a major challenge for states intending to enforce their influence internationally too, even though they are still the main actors of the system "officially", namely according to international law. In this international structure, due to its nature, all actors come across power barriers, and that also applies to great powers. The mutual dependence that emerged with the globalization of finances and the economy or global problems (climate change, organized crime, terrorism) which also force actors to co-operate and to make compromizes have not even been mentioned yet.

As indicated earlier, the current multipolar world order is characterized by a certain type of pragmatic, new realism, free of any ideology and values at the level of the great powers. This stems partly from the power relations of the international system, namely that compared to the bipolar world order international power is divided among several actors at the top of the hierarchy. These days the global efforts and power of the United States are not confronted by another global power but by the efforts and power of multiple, yet weaker great powers (China, Russia and, in certain areas, the European Union). However, similarly to the United States, these great powers use a wider range of tools of their available power potential in their own region or in their direct environment to enforce their interests or to prevent the assumed or actual efforts of the large powers opposing them. They also use tools that are not permitted under international law or international norms. As an example, Russia, who interprets NATO enlargement as the extension of the sphere of interest of the United States, made it clear in 2008, with the five-day-war, that Georgia's NATO accession would violate its interests and in 2014 it prevented the approach of Ukraine towards the European Union by annexing the Crimean Peninsula and supporting the separatists in Eastern Ukraine. China, for who maritime trade routes and access to the hydrocarbon resources in its neighbourhood are of strategic importance, is in permanent dispute involving frequent threats of armed incidents with eight countries focusing on the tiny islands of the South China Sea and Eastern China Sea and their disputed sea borders (Brunei, Cambodia, Indonesia, Malaysia, the Philippines, Taiwan, Vietnam and Japan). These examples illustrate well that both great powers look at their immediate neighbourhood, either openly or less openly, as their own sphere of interest.

Whenever great powers rely on the use of violence the most frequently occurring question is whether this new realism and new sphere of interest policy could lead to a wider and greater conflict of great powers or, in other words, whether it could lead to the conflict-based power politics known from the 19th and 20th centuries. Most experts believe that it is very unlikely, due to three main reasons. First, because the strategic approach of great powers is rather similar despite all their disputes; second, because their strong mutual dependence also limits their own ambitions; third, because although their military capabilities are not identical, the difference in their capabilities does not provide any advantage of strategic scale to any of them. Consequently, the risk of a direct armed conflict between great powers does not increase significantly even within the framework of new realism, but the "proxy wars" may become more frequent (as we can see in the case of the Syrian civil war), if great powers believed that they can protect themselves from the consequences.

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Gusztáv Báger

Integrity and security

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Abstract

The study focuses on the importance and potentialities of integrity from the point of view of security. It states the reasons for expanding the integrity approach and offers definitions for integrity and the system of integrity management. It introduces the integrity approach developed in the Netherlands and the experiences of the first pilot survey in Hungary based on that approach. The paper reviews the methodology of the Integrity Project developed by the State Audit Office and the results of the annual surveys for identifying areas of corruption risks, with special attention to the police and national defence. In this context, it briefly specifies the objectives of the anti-corruption programmes and action plan of the Government. In addition, through surveying some of the areas, the study illustrates the multi-purpose use of integrity in the framework of state-building. It also introduces two integrity approaches of the overall evaluations of national security systems: (i) the approach applied by Transparency International, and (ii) the new approach based on evaluations of the performance of state functions and important tasks suggested by the author.

Keywords: integrity, system of integrity management, corruption, preventive approach of corruption, corruption risk analysis, gap analysis, integrity indexes, integrity "hard" and "soft" controls, political integrity

Introduction

The *aim of the study* is to present what potentialities the integrity approach and toolkit has for safeguarding and strengthening security. One of the courses within this option is of a general methodological character: integrity methodology can effectively contribute to the solution of problems threatening security in the field of preventing corruption; the other course of application involves supporting good state functioning as related to some aspects of security and facilitating monitoring the values inherent in it.

The examined topics of these options are:
- outlining the paths to integrity;
- the concept and management system of integrity;
- the development of integrity approach-based anti-corruption programmes;
- options for the multi-directional and multi-purpose application of integrity; and
- the evaluation of the national integrity system from the viewpoint of security.

Of *the paths for expanding the integrity approach that are* relevant to this paper, the role of the transitions from ethics to integrity and from integrity to good governance, as well as the role of the related changing priorities need highlighting.

Two decades ago the predecessor of this integrity approach, which predominantly followed the Hegelian concept of recognition, was called *public service ethics* in literature, wherein attention was mainly focused on whether the moral strength which guides the conduct of public servants exists and if it does, what it entails. This ethos is still reflected in the studies of the 1997 OECD symposium (OECD, 1999) and its reference document accepted in 1998 (OECD, 2000a; 2000b), which made proposals for the principles to be followed and for the methods of application of ethical and professional standards in a way that ethics appeared equally as moral philosophy, regulatory values and norms, as well as moral (practical) guidelines to be observed in public service. In the documents emphasis was also laid on the proposal of the necessity of training public servants on ethical issues as an institutionalized task.

Going beyond that, as a result of European research over the last twenty years, authors in numerous studies (see for example Cox et al., 2009) have favoured the use of the key concept of integrity as opposed to ethics. In this, a decisive role was played by the concept of integrity involving:
- not only the ethical values and thinking (perception and intention) but also acting correctly;
- the requisite professionalism and competences;
- conformity with social and legal rules (the rule of law), and
- monitoring organizational and operational aims and regulations.

It should also be noted that, regarding the role of these main characteristics, there is an appreciable difference from the facets typical of the approaches to ethics in the United States of America, where, in both literature on the subject and administrative practice, "make-things-right" ethics and placing ethical decisions at the core of good management, including naturally the consideration of related options, continue to dominate. On the basis of these differences, however, it would be wrong to draw the conclusion that one approach and practice is better than the other (Cox et al., 2009). The comparison merely provides a brief description of the process as to why integrity came to be used as the priority in the target system mainly in Europe.

The first promising area for the use of the integrity approach and methodology was the development of anti-corruption programmes mainly in the Netherlands. In this activity the type of methodological conservatism represented by the approach worked well. This mainly focused on exploiting the hidden potentials in the current situation and the prudent launch of targeted changes and reforms as opposed to the ethical activism of the United States. This

aided the recognition that integrity may be an essential pillar of good governance. Its use in this way is justified by the fact that it encourages the implementation of such government activities and culture where particular emphasis is placed on understanding, commitment and an efficient, ethical decision-making practice.

Carrying through state reforms of this nature today is made particularly necessary by the continued effect of the international financial and economic crisis of 2008–09, which increases the fragility of state structures and hinders governments in creating efficient institutions and sound national economic frameworks. In the face of these challenges, taking account of international experiences, integrity-based state building is capable of effectively promoting the safeguarding and strengthening of political and social security.

The concept and system of integrity

The concept of integrity

The elements of the general concept of integrity are as follows: adherence to moral and professional rules and norms (e.g. incorruptibility, impartiality, lack of prejudice) and wholeness (completeness). From the aspect of practical application, interpreting this concept presents difficulties as there are many parallel and frequently overlapping definitions.

The word integrity is derived from the Latin *in + tag (base of tangere, "to touch"),* meaning "not" "touching". Mainly the following attributes indicate its overall contents: integrity is inviolable good behaviour that is beyond reproach and compliant with moral principles. The concept of integrity comprises *organizational integrity, personal integrity* and the *integrity of relationships and contacts,* in other words *professional integrity,* which includes these core values: respect, openness, personal responsibility and professionalism. Thus integrity means honest, fair and rule-compliant behaviour whereby the legitimacy and effectiveness of the public sector and trust in the state (public sector), and thus security, are strengthened by the activities of the institutions and employees.

In this context integrity is the application of and compliance with values and norms generally accepted in everyday practice (van den Heuvel – Huberts, 2003). *Community integrity* in the case of a country refers to compliance with and the application of social values and norms generally accepted in the everyday practice of its public sector organizations (institutions).

The system of integrity management

Considering that integrity is one of the pillars of good governance, and thus a prerequisite of security and trust in the government, particular attention is paid to integrity management in each country and in the activities of international institutions and integration.

The *system of integrity management (framework)* constituting the basis of management is an overarching, system-based methodology which, building on two decades of research and practical experience, combines all those instruments, processes and structures that

help strengthen integrity and prevent violations. The main requirements of the system are that it should:

- provide ongoing support for the improvement of good governance in the long term;
- develop cooperation between public organizations in a way that openness and broadly shared interests demonstrated in achieving common goals are enforced on the part of the institutions; and,
- be based on the logical and theoretical correlations of domestic practical experiences and already applied international best practices as well as the prudent definition of the professional and financial capacities required for the provision of the activities.

Table 1 shows the integrity management framework based on the system developed by the OECD using the summarized practical experiences of countries.

Table 1

Components of the integrity management system

Key components	**Core instruments, measures**	**Complementary instruments, measures**
Instruments	Legal codes, rules, instructions, training, advice	Integrity as a criterion in personnel selection and promotion
Processes	Continuous developmental and individual measures, programmes	Processes in personnel policy in practice
Structures (actors)	Key staff for strengthening organizational integrity	Personnel policy, contract management, financial management

Source: OECD, 2008

The first key component of the framework is comprised of *instruments* which may be used to stimulate integrity, for example to prevent corruption. These instruments exercise a beneficial effect on integrity and corruption through the other key components, the *processes of activities and organizational structures (actors) of the institutions*.

These three key components exert an effect on two layers, which contain core and complementary instruments and measures. At the heart of the framework are the core instruments (ethical codes, integrity training, etc.), core processes and cores structures (actors) whose immediate purpose is to strengthen integrity. Strengthening integrity, however, is not the immediate purpose of the complementary instruments, complementary processes and complementary structures (actors), but these may have important effects on the examined areas. Of the key components, instruments of major importance are placed in four categories in the OECD methodology (Figure 1). These are defining the purposes of integrity, guiding towards integrity, monitoring integrity and enforcing integrity.

Considering that the framework operates at the *level of individual public administrative institutions*, the components are to be interpreted in this *inner context*. In developing the *outer operational context and relational elements* of such an integrity management system, it is expedient to use the logical and theoretical interconnections described in Table 1 and Figure 1 as a basis. The outer context is also vitally important to the system of integrity management because the operation of institutions may be appreciably affected by economic, political and other outside *factors*, and there may be external *instruments*

influencing the functioning of the integrity management system (such as ethical codes and methods of accountability) and non-institutional *actors* that again may have a significant influence on the functioning of the integrity management system. Of the last of these, a particularly important role is played by legislation, political parties, the State Audit Office, the judiciary, the police and prosecutor's office, local governments, the media, civil society and international (global) institutions.

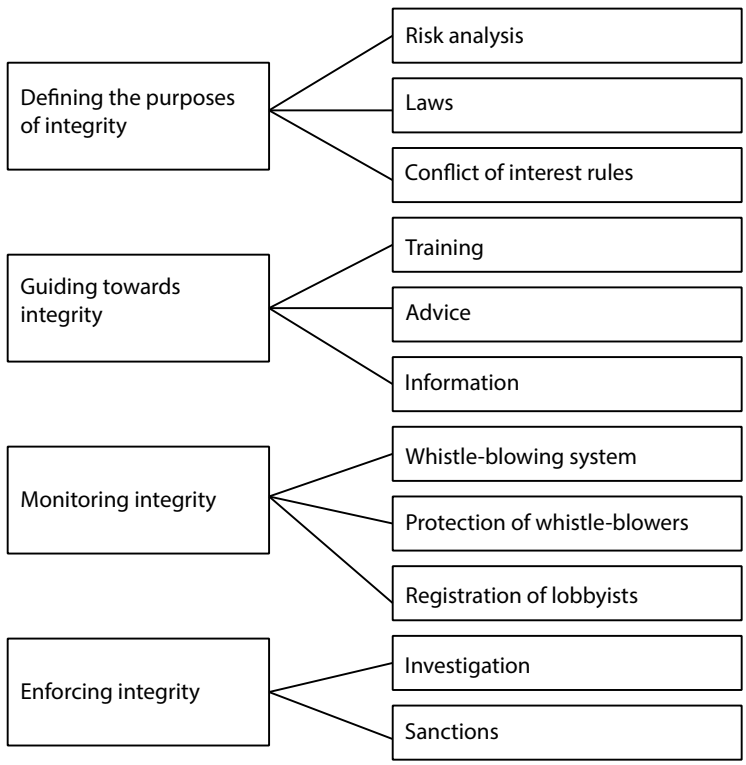

Figure 1
The instruments of integrity management

Source: OECD, 2008

Pilot survey of corruption risks in the public sector

The first decade of the new millenium did not see a reduction in corruption in Hungary. On the contrary, according to the Corruption Perceptions Index (CPI)[1] compiled by Transparency International (TI), the highest score of 5.3 that the country obtained in 2001 fell to its lowest in the decade, registering 4.7 in 2010. The trend of the domestic index of the level of the perception of corruption also warrants more determined action against corruption than hitherto.

[1] On the scale of 1 to 10 of the index, 10 means no corruption.

The existence and frequency of the phenomena of corruption are better known, albeit to an insufficient extent, from different surveys than their root causes. For this reason the targeted measures taken in Hungary tended to be of an exposing and punitive nature rather than preventive action resulting in lasting improvement. Thus, besides the necessary activity to expose and repress corruption, it was important to direct greater attention to assessing vulnerability to corruption and investigating the multiple reasons for the phenomena of corruption. To this end, we conducted a pilot survey using *a version of the Dutch risk analysis methodology adapted to Hungary*[2]. Its aim was to make the logic and essence of the methodology known to a broader professional audience on the one hand and on the other hand to use the methodology to better reveal and explore the potentials for the development of corruption in a few key areas of the public sector.

On the basis of the results of the risk analyses of the pilot survey, we also pointed out the distinctive feature of the proposed methodology to show the measures and proposals required to increase the efficiency of the functioning of the integrity management system.

Methodology

The approach of the Dutch methodology for assessing vulnerability to corruption, with regard to the "corruption triangle" (opportunity, motivation and justification), starts from eradicating opportunity, removing motivation and counterbalancing aspects of personal self-justification, and assumes that *the way in which an organization operates can be an effective tool* for this purpose. Thus public institutions themselves can play an important role in preventing corruption by increasing their *integrity.*

This approach of the Dutch methodology[3] clearly highlights the factors facilitating corruption and the resolve of the organization from the viewpoint of the fight against corruption. It concentrates in particular on measures that the organization may take to prevent corruption situations from arising and to increase its own integrity. *The methodology consists of five stages:*

1. *Identification and assessment of vulnerable areas* in the activities and processes of the organization which appear in relationships between the government and citizens (business sector) involving the conclusion of contracts, issuing documents, legislating and the application of the law as well as in the management of state property.
2. Assessment of the *factors increasing vulnerability* (growing complexity, rapid changes, management and staff).
3. *Assessment of the level of maturity of the integrity management system,* which indicates how resilient a particular organization and its organizational units are to the arising corruption risks.

[2] The Research Institute of the State Audit Office of Hungary (until 31 December 2008, Development and Methodology Institute of the State Audit Office) and the Netherlands Court of Audit, under the European Union's Transitional Aid, conducted a *Twinning Light* type project in 2007–08 with the aim of devising a risk analysis method which can be of use in identifying the type, place and nature of corruption risks in the Hungarian public sector.

[3] For a detailed description, see Báger et al. (2008a; 2008b) and Báger (2012).

4. As the continuation of these stages, conducting a *gap analysis*, which establishes whether there is a satisfactory balance between the vulnerabilities found in stages 1 and 2 and the level of maturity or resilience of the *integrity management system* assessed in stage 3.
5. Insofar as there is not, the result of the gap analysis provides grounds to determine how to appropriately address the most vulnerable processes and *what measures are needed* to improve resilience to the risks of corruption. Thus the output of the analysis is a *management report or action plan*. This report clarifies to the management of the institution the areas where immediate action must be taken to strengthen the organization's resilience to breaches of integrity. Addressing the areas thus identified as priorities increases the efficiency of the *integrity policy*. An essential requirement for this policy is the coordinated application of the rules-based and values-based approaches (OECD, 1996). With regard to the former, the emphasis is laid on the rules and processes set by the state as an instrument to reduce violations of integrity, whereas the values-based approach focuses on understanding the ethical requirements and norms for this purpose and their actual implementation in practice. As regards balancing the two approaches, it can be noted that an ever broader range of public organizations apply this recommendation (OECD, 2000b), and that governments are increasingly shifting towards the application of the values-based approach as opposed to the rules-based approach.

As a result of these measures, a *risk map* can be compiled which illustrates the corruption risks and helps to identify the right lines of action in the public sector. This was first attempted by the Research Institute of the State Audit Office (SAO) in 2008, which requested the ministries to *participate in a pilot survey.* By completing a questionnaire, the ministries identified the corruption risks that appeared within their own department and the factors increasing them.

Main results

The survey consisted of two parts: the first strove to expose the (internal) corruption risk (vulnerability) concealed in the activity performed, and the second the (mainly external) circumstances increasing vulnerability. In the questionnaire's first part covering the relationships between the government and citizens (business sector) and the management of state property, the activities and processes presented in Table 2 were listed. We only departed from the general pattern insofar as was justified by the specific characteristics of the ministerial activities. For example, legislative preparatory activity was examined in greater detail as this is one of the most prominent primary activities of ministries.

In completing the first part[4], the ministries had to consider which of the vulnerable processes and activities listed in Table 2 were typical of them. They were also asked to evaluate whether each process of activity was primary (a core activity of the ministry) or secondary (complementary to the realization of a core activity) in the ministry. In the second part of the questionnaire, questions concerning two groups of factors contributing to cor-

[4] Replies suitable for evaluation were received from 8 ministries.

ruption were posed, regarding firstly complexity and secondly changes/dynamics. (Table 3 provides details of the characteristics.) The ministries were asked to consider which of the circumstances listed were typical of their specific ministry and what effect the particular circumstance had on the activity of the ministry.

Based on Table 2, *three general statements* can be made:

- There are many processes in the activities of the ministries which carry the risk of corruption (concluding contracts, cash payments, preparing legislation).
- For the most part, these processes are not related to the core activities of the ministries but to their complementary activities.
- From the aspect of the primary vulnerability to corruption, the ministries do not form a single set and the tasks of each ministry are different also from this viewpoint.

Table 2

Vulnerability concealed in activities

Typical characteristics	Type	Activity	Primary process	Secondary process	Not typical
Relationship between government and citizens (business sector)	Contracts	Open tenders	2	4	2
		Restricted tenders	3	5	
		Engagement contracts		8	
		One-off procurements		7	1
	Payments	Aid to businesses	1	3	4
		Benefits and allowances for individuals		3	5
		Sponsorship of civil sector	3	3	2
	Authorization	Permits	4	1	3
		Approvals	3	1	4
		Certificates	2	3	3
	Drafting legislation (content)	Requirements related to products	4	1	3
		Defining aid conditions	7		1
		Defining authorization conditions	6		2
		Defining technical requirements	6	1	1
	Applying the law	Supervision	5	1	2
		Control	5	1	2
		Investigation	1	3	4

Managing state property	Information	State secret	3	2	3
		Professional secret	3	2	3
		Trade secret	2	4	2
	Money	Bonds and shares			8
		Portfolio management	1		7
		Handling cash/transfers		5	3
		Premiums, reimbursement of expenses, bonuses, employee benefits		8	
	Assets (moveable, immoveable)	Sales and purchases		4	4
		Asset management	1	5	2

Source: Own compilation

Table 3

Circumstances increasing vulnerability

1. Complexity	**Yes**	**No**
Innovation/advanced computer systems	5	3
Complex legal environment	8	–
Special (legal/fiscal) constructions	5	3
Bureaucracy	6	2
Relations systems	5	3
Lobbying	4	4
Political influence/intervention	6	2
Mix of public interests and private interests	1	7
Necessity of involving outside experts	7	1
2. Changes/dynamics	**Yes**	**No**
Young organization	4	4
Frequently changing legislation	8	–
Strong expansion or downsizing	3	5
Outsourcing, PPP	4	4
Crisis (reorganization, serious threats, danger of dissolution of organization or losing jobs)	3	5
External pressure (pressure to perform or pressure due to expenditure, potential pressure of time or political pressure, scarce or lack of resources for tasks)	8	

Source: Own compilation

Based on the responses, *drafting legislation was the most vulnerable area*, and in particular:

- defining aid conditions (7 ministries indicated this to be a primary process);
- defining authorization conditions (6 ministries indicated this to be a primary process), and
- defining technical requirements (6 ministries indicated this to be a primary process).

In the opinion of the ministries, the area which carries the *second greatest risk* of corruption is the *application of the laws,* and in particular:

- supervision (5 ministries indicated this to be a primary process), and
- control (5 ministries indicated this to be a primary process).

The *vulnerability concealed in authorization activity was also significant:* issuing permits (4 ministries indicated this to be a primary process) and approvals (3 ministries indicated this to be a primary process). The *risk of corruption in concluding contracts was heightened in* restricted tenders (3 ministries indicated this to be a primary process and 5 ministries a secondary process), engagement contracts (every ministry indicated this to be a secondary process), and one-off procurements (7 ministries indicated this to be a secondary process).

The answers given to the *existence of circumstances increasing the possibility of corruption* are summarized in Table 3. It can be established that *circumstances related to complexity* constituted factors seriously increasing risk at the majority of the ministries. At the same time, only one ministry indicated that the mix of public interests and private interests was such a circumstance. By contrast, all ministries gave an affirmative response to the *complex legal environment,* and all but one ministry to the necessity of involving outside experts. Most ministries indicated *political influence/intervention and relations systems* as existing circumstances increasing the risk of corruption. The written explanations, however, revealed that the ministries interpreted different forms of behaviour as political intervention. This ranged from influencing individual decisions to the political prescription of the development of policy.

Regarding *changes/dynamics,* the ministries clearly perceived *frequently changing laws and other regulations as factors significantly increasing the risk of corruption.* The opinion that decision-makers ought to devote special attention to these factors is justified. An amendment to the law which is in itself constructive serves no purpose if a multitude of changes confuses the application of the law and gives rise to individual interpretations.

Every ministry thought that *pressure to perform* was a *factor increasing the risk of corruption*. Attention also deserves to be given to this because experience shows that meeting demanding expectations to perform when the resources available for tasks are scarce frequently and easily brings respite from compliance with the rules and undergoing checks, and thus becomes a source of corruption.

In Table 4 – without naming the ministries – we tried to convey a summary of the different ways in which each ministry perceives the corruption risk to their own activity. It is important to stress that vulnerability is an objective category and does not mean that corruption will occur in fact. However, awareness of this is required in order to prevent or eliminate corruption more effectively.

The data in the table below show that the ministries judge the degree of vulnerability to corruption of their activities very differently. As can be seen, there were ministries that

identified all the factors increasing the risk of corruption in their environment but there were others that indicated that their regular activities included all the activities carrying the risk of corruption in themselves. Apart from these extremes, the figures indicate that *the activities of ministries are exposed to numerous corruption risks*. Consequently, regularly revealing these risks and the factors increasing the risks has a significant role in preventing and reducing corruption.

Table 4
Characteristics of vulnerability in the ministries

Number allocated to ministry	Number of vulnerable activities			Number of factors increasing vulnerability
	Total	Primary	Secondary	
1.	20	3	17	14
2.	26	13	13	12
3.	9	6	3	11
4.	20	11	9	10
5.	18	9	9	8
6.	22	7	15	8
7.	21	11	10	6
8.	15	8	7	6
Maximum value	26	26	26	14

Source: Own compilation

The experiences of a trial self-assessment

The *Ministry of Economy and Transport* involved *appropriations for small and medium enterprises* in the self-assessment[5]. These funds provide financial support by tendering for this business sector, which plays an important role in the development of the economy. In this area, factors increasing corruption included the difficulties of special legal interpretations, lobbying, political influence as well as pressure to perform. These above all drew attention to the broader application of the principle of transparency and the importance of providing versatile information about changes in the law.

In the case of the *Szigetszentmiklós Local Authority*, the trial involved the Building Control Department and in particular issuing building permits. Here the high risk of violating the rules of integrity was primarily caused by the inadequacy of the IT system and the shortage of labour. In this area, mixing public and private interests could also pose a threat.

[5] The self-assessment was performed by employees familiar with the organization's functional processes. Naturally, for this a representative employee group to conduct the self-assessment needs to be chosen whose members know their own work environment, the managerial measures and their implementation in practice. Like this, a relatively accurate picture can be gained of the risks and risk-increasing factors.

One important lesson of these two pilot schemes was that the concept of integrity is little known among the employees of public institutions. Thus, in order for self-assessment to be efficient, special attention must be paid to raising awareness of the method (identical usage of terminology, interconnections between the different parts of the methodology and simplifying the method of scoring applied) and to the preparations for application (written information material, training, providing a trained moderator). With the right managerial support, *self-assessment is feasible* as the participants took part in the joint work with interest and responsibility, and expressed their willingness to participate in the future as well.

The State Audit Office's integrity project

Based on the experiences of the pilot survey of corruption risks, the first extensive and large-scale application of the integrity risk analysis methodology was carried out in the framework of the integrity project of the State Audit Office (SAO) in 2011 and subsequent years. The overall purpose of the priority project launched on 1 December 2009 with European Union funding was to promote the establishment of corruption-free public administration that functioned within legal limits on a professional basis, and to lay the foundations for shaping awareness at the level of society by the widespread dissemination of the integrity approach. This goal was consistent with the requirement for audit offices, in addition to their control tasks, to undertake a forward-looking, preventative approach and practice to avoid the errors experienced in the process of using public funds.

To this end, the SAO undertook, for the purposes of the integrity project, to conduct a nationwide survey on a voluntary basis using an online questionnaire for 7 years between 2011 and 2017 with the participation of budgetary organs selected in advance annually. The answers are used to create a database which can help in defining the corruption vulnerability and internal control indexes of state organizations.

Method of the first integrity survey

For the first survey conducted between 8 February and 31 March 2011, the State Audit Office selected 4 111 budgetary organs from the 14 409 operating in Hungary by proportionate stratified sampling, to which an electronic questionnaire of 155 points assessing corruption risk characteristics was sent by post and/or through the online Office Gate system together with information about completing it.

The project office formed the target group through proportional sampling according to region (small region) and institution type involving, in addition to traditional public administrative bodies, institutions providing healthcare, social, scientific, educational, cultural, sport and leisure public services. The range of target institutions fully covered independent state authorities, central and regional public administrative bodies (484 organizations), the offices of the local government representative bodies (1 223 organizations), regional clerk's offices (680 organizations) as well as judicial bodies and law enforcement agencies.

Access to the questionnaires, completing the form and sending it in the right format was aided by the staff of the Integrity Info Line established for the project as well as information material and electronic Help applications on the Integrity Portal. The project office measured 10 411 visits and 34 991 downloads on the Integrity Portal during the survey period. The first national survey was supported by a broad information campaign and a series of regional events throughout the country. As a result of the regional press conferences following the events, the integrity project registered almost 200 media mentions, which proved very useful in conveying the meaning of integrity and its dissemination to a wider audience.

The questionnaires completed by the respondent budgetary organizations were received via the SAO's document management system by the electronic survey, processing and mapping system devised within the integrity project, which calculates vulnerability indexes by running predetermined mathematical algorithms. These *indexes, however, do not indicate the existence of corruption but corruption vulnerability and the type of controls the institution uses in order to eliminate and handle the existing situations exposed to corruption*. In this way the values of three outcome indexes were defined:

1. The *inherent vulnerability factors (IVF) index* reveals the organizations' vulnerability factors dependent on their legal status and areas of duties. If, for instance, an organization issues official certificates and passes, exercises authority over the infringement of regulations and imposes fines, these are identified as corruption risk factors and the value of the index rises accordingly.

2. The *vulnerability increasing factors (VIF) index* shows components dependent on the functioning of the given institution which increase inherent vulnerability. If, for example, the respondent body received EU grants in the examined period, participated in the preparation or arrangement of a public procurement procedure, utilized one of its properties, or had the right of disposal over securities or property rights, these are identified as factors increasing vulnerability to corruption.

3. The *risk reducing control factor (RRCF) index* reflects whether there are institutionalized controls at a given organization, and whether these actually work and fulfil their function. Here the existence of controls such as rules on conflicts of interest, accepting gifts, public procurement, the involvement of an outside expert or the selection of new labour is examined.

As opposed to the identified inherent vulnerability and vulnerability increasing factors – as we can see –, there are the controls (RRCF index) on the other side of the scales which the institution in question *may use in order to be able to counterbalance vulnerability to corruption.* If this option does not exist or the available controls are not suitable for this purpose or are insufficient, the vulnerability factors related to activities and situations which may lead to committing acts of corruption are identified. Thus, through the analysis of the applied indexes, the survey method enables the areas of the *security gaps* requiring attention to be ascertained. The related *gap (RÉS) analysis*[6] has the following stages (State Audit Office–Ministry of Interior, 2015):

[6] The method used was an adaptation of the gap analysis devised to assess the integrity maturity level of Dutch public administrative bodies and was given the acronym RÉS, formed of the initial letters of the Hungarian words for Systemization + Assessment + Regulation (establishing need for regulation). The Hungarian word *rés* means "gap".

1. Identification of all recognized risks related to the functioning of the organization and the control suitable for handling these at an organizational level and at the organization's managerial level (systemization).
2. Defining the rules containing controls[7] applied by the given organization or which are not applied but possible (expedient and necessary) for the given organization. This is the second stage of the analysis, which identifies potential gaps between
– the risks and controls, and
– the controls and their appearance in the regulations (assessment).

A recognized risk for the handling of which the organization has no appropriate control is to be interpreted as a gap.

3. Defining further regulations necessary to eliminate the gaps identified as well as the necessity of changing existing regulations. A necessity to regulate exists when the conditions for the functioning of the control suitable for handling the risk identified are not defined by the organization's regulations.

Main results

In the fifth *survey* in 2015 *the number of institutions completing the questionnaire was* 2 557 compared to the 1 095 institutions which took part in the 2011 survey. Thus the number of respondents more than doubled and grew by 61% in 2015 compared to that in the previous year (Figure 2).

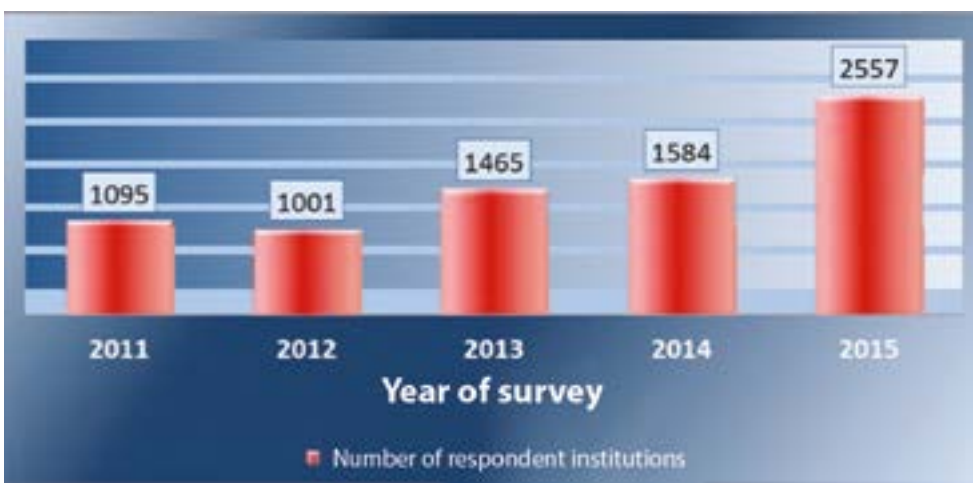

Figure 2
Trend in the number of respondent institutions, 2011–15

Source: Domokos et al., 2016

[7] *Applied control* is to be interpreted as the control actually operated and regulated by the organization. *Possible control* covers all expedient and necessary tools which are suitable for handling an identified risk but which are not regulated by the organization and for which no conditions of application have been created.

Interest in participating in the survey was boosted by the establishment of the Circle of Integrity Supporters in 2013. The Circle includes public institutions which undertook to take part in the integrity survey every year until 2017. At the 2015 survey 2 172 institutions belonged to the Circle, corresponding to 84.9% of all respondents. The evaluation of the data aids the annual distortion-free comparison of the results of the respondent institutions and the direct measurement of changes (Domokos et al., 2016). The trend in the *organizational integrity of public institutions* in 2013–15 is reviewed using the three indexes by defining the average values of indexes calculated for the range of institutions which took part in the surveys of previous years weighted by the 2015 participation data for better comparison.

Figure 3

The 2015 index values and the 2013 and 2014 indexes weighted by the 2015 participation data

Source: Domokos et al., 2016

As shown by Figure 3, in the three-year period the IVF indexes represented a risk level about 10 percentage points higher than the VIF indexes. In other words, the role of the inherent vulnerability factors in the development of organizational integrity was greater than the role of the factors increasing vulnerability to corruption. It can also be stated that the IVF and VIF indexes showed a downward trend in all three years, which is particularly important as regards the inherent vulnerability factors, where the 2015 value was 3.3 percentage points lower than in 2013.

The value of the *risk reducing control factor (RRCF) index*, counterbalancing vulnerability to corruption, rose on average by 1 percentage point each year over the three years, indicating a gradual expansion of the toolkit opposing corruption. From this viewpoint, the result of the SAO based on the survey over the last two years showing the controls that were most frequently applied in the 779 respondents' opinion is particularly valuable (Figure 4).

Figure 4

Special anti-corruption systems and processes applied by institutions participating in both the 2014 and 2015 survey, 2014–15

Source: Domokos et al., 2016

This shows that the control factor with a very high frequency of application was public access to the organization's financial data (94%). Next came the control applying the four-eye principle with 51.3% in 2014 and 55.9% in 2015. This control was followed by the ethical code, a system handling external complaints, a whistle-blowing system and anti-corruption training organized for employees over the last 3 years. The result of the survey also provides information about the low use of the options for workplace rotation and corruption risk analysis. A highly sensitive shortcoming is that the percentage of institutions conducting a corruption risk analysis is very low and indeed this rate even fell in 2015 compared to the previous year. This draws attention to the fact that the number and standard of anti-corruption training courses must be raised significantly.

Apart from the mentioned controls, the SAO also examined the opinion of the above-mentioned 779 respondents with regard to the development of the *rate of application of soft controls*. Soft controls (measures) are intended to influence in-house behaviour, the working environment and organizational culture as opposed to hard controls, which have an effect mainly through legislation, procedures and technical issues.

With regard to the rate of application of soft controls, the SAO's experts (Domokos et al., 2016) established a rise in the number of institutions which

- have regulations for the conditions of accepting gifts, invitations and travel,
- imposed an obligation for employees to declare their business or other interests relevant to the organization,
- have a publicly accessible strategy which includes the improvement of the organizational culture, strengthening integrity and anti-corruption action, and
- regulate the issue of conflicts of interest (Figure 5).

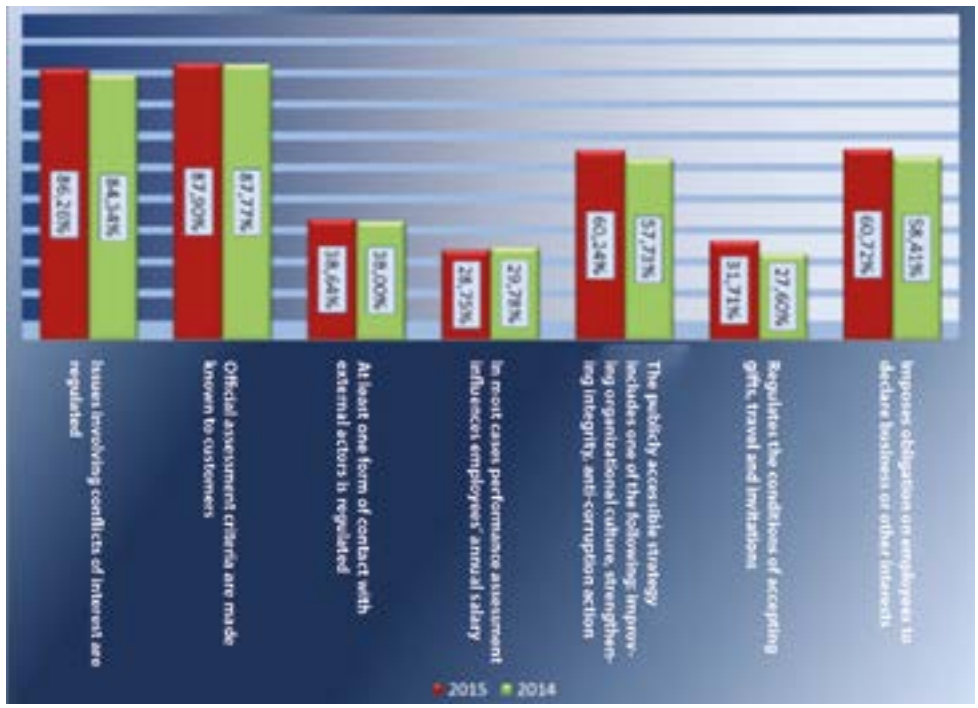

Figure 5
Trend of soft controls, 2014–15

Source: Domokos et al., 2016

Results measured in the institution group of national defence and law enforcement agencies

In addition to providing an overview of corruption vulnerability, the survey also allows *separate analyses for each institution or group of institutions* to be made about the maturity and functioning of the integrity controls intended to handle corruption risks. Such an analysis was made about the results measured in the group of national defence and law enforcement agencies (State Audit Office, 2016). The purpose of the analysis was to provide help to the national defence and law enforcement agencies in systemising the corruption risk factors and assessing the necessary controls more efficiently.

The survey in 2015 included the agencies with the following NACE codes: 8422 defence activities, 842260 civil defence activity, 842340 prison administration, 842410 public order and safety administration, 842420 police activities, 842460 intelligence activities, 842470 alien policing activities, 842480 disaster response activities and 842510 fire protection administration.

In 2015, in the national defence and law enforcement agencies group, the rate of response of those taking part in the voluntary survey was 88.8%, the number of organizations

which returned a completed questionnaire being 119, almost twice the number of respondent organizations in the previous years: 63 institutions in 2013 and 60 in 2014. As regards the number of agency staff, the breakdown of employees was almost the same for the 200 to 500 persons group and the over 500 persons group at the respondent national defence and law enforcement agencies. At 68.9% of all respondents, the number of employees exceeded 200 persons.

Table 5 provides information about the indexes (IVF, VIF, RRCF) for this institution group determined based on the index values of 119 agencies.

Table 5

Trend of overall index values in 2015 (%)

Institution type	IVF	VIF	RRCF
National defence and law enforcement	32.4	26.3	78.9
Index calculated for all respondents (2 557 organizations)	31.8	21.9	60.4

Source: State Audit Office, 2016

Based on the index values of this institution group, the following statements can be made:

- *The institution group's inherent vulnerability (IVF) level* somewhat exceeded the level of inherent risk calculated for all respondents. The reason for this is the role of the increased influence of exercising public authority powers on the one hand, and on the other the complexity and occasionally contradictory nature and deficiencies of the external regulatory environment. Based on the answers, 8.4% of the 119 agencies have legislative powers, and 42.9% have individual official powers, i.e. apply the law. In this group 86.3% of the agencies had powers of authorization.
- *The vulnerability increasing factor (VIF) level* was 4.4 percentage points higher than the value calculated for the whole range of respondents. This is related to the fact that this institution group has a greater than average share of EU funds and cooperates to a large extent and continuously with non-state bodies. Moreover, the number of criminal proceedings and ethical proceedings due to breaches of obligations instituted against the employees of the agencies is large.
- *The established control (RRCF) level* for the group of national defence and law enforcement agencies exceeded the average control level of the whole range of respondents significantly, by 18 percentage points. This is largely due to the fact that procurements not reaching the public procurement ceiling are regulated to a greater than average extent in the case of this institution group and the practice of inviting three quotations is more frequent as is the application of a systematic risk analysis and individual performance assessment system. The favourable situation is also due to the fact that the agencies have a public strategy, more efficient internal control and regulations concerning the involvement of outside experts, and conduct anti-corruption training and corruption risk analyses.

As regards factors increasing the risks of corruption, the fact that there was a change in the organizational structure over the last three years at two thirds of the national defence and law enforcement agencies, and on more than two occasions for 20.2%, played a vital role.

Another significant factor increasing vulnerability to corruption was European Union aid considering that 37.8% of the agencies received such funding, half of them being granted not more than HUF 100 million and a quarter of them between HUF 101 million and HUF 1 billion. The third important factor increasing the risks of corruption was public procurement as 64.7% of the agencies took part in preparing and arranging public procurement procedures. In the case of 12 agencies, the public procurement procedure was challenged by the Public Procurement Arbitration Board, which ruled against the agencies in eight cases. Vulnerability was also increased by the fact that over the last three years, of the agencies involved in public procurement, a public procurement procedure with less than 3 tenderers was conducted by 29.9% on one to three occasions and 16.9% on more than three occasions. Finally, engaging outside experts and the use of outsourcing are also to be mentioned among the important factors increasing risks. In 2014, 34.5% of the respondent institutions indicated the use of such engagements although the activities concerned were among the functional duties. The survey also revealed that 19.3% of the national defence and law enforcement agencies received a financial gift or other material support directly or indirectly from private individuals. Regarding controls reducing risks, a result of outstanding importance is that 89.9% of the agencies conducted risk analyses systematically and 95.3% of them recorded the revealed risk factors in a database, while 97.2% assessed the results of the risk analysis. Internal control is likewise a well-functioning system for 96.9% of the agencies. A strategic control plan was drawn up by 96.5% of the respondent agencies and 97.4% had an annual control plan based on the risk analysis.

In summary, it can be established that in the national defence and law enforcement institution group the State Audit Office's survey presented the most important risk factors and the strengths and weaknesses of the control system in a variety of ways. This information may help the agencies' leadership to correctly identify the development pathways to enhance integrity. Thus the level of organizational integrity is satisfactory in national defence and law enforcement, and indeed as regards the established controls this area exceeds the national average. All these are indispensable conditions for organizational integrity to efficiently strengthen security and trust.

The performance of Hungarian law enforcement is also satisfactory at a European level. According to an international survey, in 2013 in Hungary a minority of the population (31%) was of the opinion that the police offered preferential procedures to certain groups of the society as opposed to the Central and Eastern European countries (39%), and, as specific examples, Croatia (54%) and Slovakia (50%). The rate of the Hungarian index is close to the European Union average of 30% (Charron, 2013).

The government's anti-corruption programmes

In the light of what has been said, it can be regarded as natural that the Public Administration Corruption Prevention Programme (2012–14), which was adopted in 2012, follows the approach that, going beyond the almost exclusive use of criminal instruments, *the spread of the integrity approach, already tried and tested in international practice, is necessary in order to advance successfully.*

The *overall aim of the programme* is to bring into being a public sector that recognizes, condemns and rejects the phenomenon of corruption by strengthening the resilience of state organizations to corruption and to create solidarity throughout society in order to facilitate the consolidation of ethical values and a value-based approach in practice. In this way public administration and public services could provide a model to be followed by business, reinforced by the government's targeted awareness-raising programmes to prevent economic abuses in the business sector, thereby indirectly also reducing economic corruption. In order to facilitate this, it was the task of the *Ministry of Public Administration and Justice to outline the path of and provide state coordination for corruption prevention*. In this regard it should be noted that the preparatory works of the programme were also done by the Ministry.[8]

The programme's basic principles enabled the achievement of its most important targets in the period between 2013 and 2014. These are that the public administrative bodies:

- *devise a yearly corruption prevention action plan based on the assessment of their integrity and corruption risks* in order to handle the risks identified;
- prepare annual integrity reports about the performance of the current year's *corruption prevention action plan*;
- through their managers have to ensure the receipt and investigation of *reports* of violations, irregularities and corruption risks (whistle-blowing) concerning the organization's functioning, and devise procedures for this purpose;
- appoint integrity advisers[9] for public administrative bodies with more than fifty employees;
- *oblige all officers and managers to take part in training on the subjects of integrity, corruption prevention and ethics*.

From the viewpoint of implementation in practice, an important *rule providing a guarantee* is that the assessment of the integrity and corruption risks, drafting the annual integrity reports and devising the procedures for handling reports are the *personal liability of the head of the organization*. In supporting the implementation of the programme, an important role was played by the *Ministry of Public Administration and Justice in association with the National University of Public Service launching a priority project with a budget of HUF 680 million in December* 2012 under the State Reform Operational Programme (ÁROP) with the title of *Prevention of Corruption and Overview of Public Administration Development.*

The project implemented the following three training courses, each with a different focus, for the prevention and reduction of corruption:

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[8] Under this scope, on 18 November 2011 the President of the State Audit Office, the President of the Supreme Court, the Prosecutor General, and the Minister of Public Administration and Justice issued a joint statement of their commitment to act against corruption.

[9] The *integrity adviser* cooperates in assessing the integrity and corruption risks related to the functioning of the public administrative body, and in drafting the action plan to handle these as well as the integrity report about the plan's implementation; makes proposals for holding vocational ethics and anti-corruption training at the public administrative body, and participates in its implementation; provides advice and information to the managers and employees of the organization in any vocational ethics issue that may arise. In the possession of authorization granted by the head of the organization, the integrity adviser performs duties related to receiving and investigating reports about violations, irregularities and integrity (whistle-blowing) and corruption risks related to the functioning of the organization on behalf of the organization's head, and may also perform the activities of the data protection officer, equal opportunities officer and disciplinary commissioner.

- *Integrity adviser specialized further training* for government officials organized by the *National University of Public Service's Institute of Executive Training and Continuing Education*. The training course is a classified further training programme under the government decree on the further education of civil servants. Until 31 May 2014, 120 people passed the exam in this specialization. The training is supported by the president of the SAO.
- One-day mini-training sessions dealt with the subjects of public administration ethics and integrity. A total of 8 375 people took part in the training series.
- On 4 September 2013 the 2.5 day *integrity management* training was launched for senior government officials with 751 participants.

As a continuation of the programme, the government's *National Anti-Corruption Programme for 2015–18* also started from the premise that corruption is the degradation of organizational operation that takes the form of various irregularities, crimes and unethical acts the opposite of which comprises integral operation based on accountability, developing professional and managerial competences, and abiding by undertaken values, in other words integrity. The application of efficient preventive measures, however, can only be expedient if the effective anti-corruption action is based on the balance of repressive (retaliatory) and preventive (precautionary) instruments.

An important measure in the management of the realization of the programme was that, after the Ministry of *Public Administration and Justice was abolished* in 2014, the continuation of the anti-corruption policy was transferred to the remit of the Interior Minister and its implementation became the responsibility of the *National Protective Service*. In the framework of government duties related to anti-corruption activity, the Service

- prepares the government's anti-corruption strategy and submits it to the minister responsible for law enforcement,
- devises methodological aid supporting the preparation of the corruption prevention action plan and the integrity report, and submits it to the minister responsible for law enforcement,
- conducts integrity and corruption risk assessments,
- continually evaluates the corruption situation and the situation of the anti-corruption government activity, and informs the government via the minister responsible for law enforcement,
- cooperates in the development and synchronization of the integrity management system of public administrative bodies,
- prepares anti-corruption communication materials and
- takes part in fulfilling the reporting and representation obligations arising from international cooperation and national agreements.

Under the auspices of the National Protective Service, on 1 October 2014 a new organizational unit called the *Corruption Prevention Department* directly subordinate to the chief director *started work, whose activity is extended to improving the quality of organizational operation in addition to individual prevention.* Processing feedback received from the Service's other units as well as actual cases aids the Department's work and contributes to incorporating practical experience into policy concepts (for details see Váradi–Varga, 2015).

Options for the multi-directional and multi-purpose application of integrity

After the multi-faceted presentation of the anti-corruption role of integrity, it is necessary to draw attention – albeit briefly – to certain areas where its application may form an increasingly important part of security policy considerations. These include political integrity, the integrity of law enforcement agencies and the integrity of the water sector.

Political integrity

The political integrity system, interpreted as an opposite of multi-faceted political corruption, is the sum of interrelated measures (tools and processes) through which the destructive effect of political corruption on the transparency and accountability of the government can be reduced. Although these measures vary greatly from country to country, they have three basic characteristics in common:

- they regulate and direct the behaviour of politicians;
- they prevent or at least hinder abuses of power as regards obtaining community resources;
- they increase public trust in political processes by ensuring greater social (civil) participation in decision processes (Casas-Zamora et al., 2003).

In order to achieve political integrity, countries need to take measures increasing transparency, to strengthen accountability through control and broader coordination, and to facilitate through measures the resolution of conflicts of interests among political decision-makers. In relation to such necessary measures, a real global challenge is the lack of adequate regulation as well as shortcomings in implementation with regard to existing regulations. These restrictions are particularly significant in the transitional countries where the institutional system of democracy only has a short past.

In Hungary – after lengthy debates – there has been progress in the area of political party and campaign financing in recent years. It is now forbidden for parties to accept contributions from domestic legal entities or organizations without legal personality (previously the ban only applied to legal persons linked to the state budget). Neither can parties accept any financial support from other states or foreign organizations or natural persons who are not Hungarian nationals. In accordance with the regulatory provisions, all donations exceeding five hundred thousand Hungarian forints received in the course of one calendar year must appear in the financial statements with the name of the donor and the sum given indicated. Accepting support whose origin cannot be identified is also forbidden. The media which agree to publish political advertisements must report the costs of the advertising service within five working days to the SAO, which will make this information public. Every candidate and nominating organization must make public the sum, source and method of use of state support, other funds and financial support devoted to parliamentary elections in the official journal *Magyar Közlöny* within sixty days of the parliamentary elections.

Integrity of law enforcement agencies

Due to lack of space, only some characteristic features of law enforcement integrity are illustrated by the examples of two countries.

In the Netherlands, the integrity of law enforcement units can be regarded as strong. In general, they are well-equipped, have the requisite financial resources, are sufficiently independent and work in a transparent manner. At first glance, the number of offences breaching police integrity seems high. One factor that plays a role in this is that the Dutch police has a well-functioning integrity system and thus any violations come to the surface quickly. In the fight against corruption, a key role is played by the activity of the police, and in particular the Special Investigation Unit of the Dutch National Police. The unit is an independent institution and its tasks include the investigation of corruption cases which affect civil servants. (Conducting similar investigations within the police falls within the competence of different internal services.) Of the 120-member unit, 90 people work as detectives in close cooperation with other investigatory bodies.

This organizational unit of the police deals with investigating the most serious crimes. In the course of investigating corruption cases, the activities and positions which are most exposed to abuse of power are examined. In the unit's experience, activities and positions that have public powers are the most vulnerable as regards corruption. In the course of analyzing the corruption risks, the degree of harm and the impact on public powers caused by the offences is considered. Accordingly, the incidents are placed on a scale of one to five. The degree of the harm caused is indicated separately on the scale (Table 6) in the case of the government (public administration) and economic losses.

The unit's risk analysis primarily serves the prevention of cases causing the most harm (grade five). Such a case is, for example, when an incident gravely harming the rule of law takes place (bribing judges or members of parliament). The unit most often experienced corruption crimes committed within local governments.

Table 6

Degree of corruption risks based on the harm caused

Degree of harm	Impact on government, public administration	Economic impact
	Harmful impact	Harmful impact
V	on legislation	on free competition in the whole of the economy
IV	on the government's exercise of power	on free competition in a main sector of the economy
III	on the activity of a government institution	on free competition in markets or local areas
II	on the activity of a government institution for a period of time	on free competition with regard to some enterprises
I	on the area of competence of a civil servant	on free competition in the future if it is not defined

Source: Rijksrecherche, 2007

As regards the *United States of America*, it is worth noting that certain police survey results that were conducted in relation to misconduct and corruption are valuable. In the past, the experience of surveys and studies showed that police misconduct was attributable to the personal behaviour of individual police officers. Later studies indicated that Afro-Americans are inclined to view this as more of a structural and political problem, while others believe that misconduct is only episodic and isolated.

The most recent research emphasizes that shortcomings in the management and culture of police units are the real reason for police misconduct. Thus, in order to maintain integrity, efficient measures are needed in the following areas:

- accountability of police supervisors and managers,
- equal treatment of all members of the police,
- better citizen accessibility to police units,
- more efficient inspections and audits, and
- quality training of police personnel in order to raise the standard of ethical and cultural awareness.

Based on a series of interviews conducted with 3 235 police officers, the following recommendations can be made:

- police officers should respond not only to minor offences but discipline major offences as well,
- disciplinary proceedings should be open to the public and
- police officers should be put in shifts on a rotational basis to avoid the formation of bonds that may encourage connivance.[10]

Integrity of the water sector

A new development related to integrity in recent years is that, in addition to applications of a functional nature, sector-type applications have also appeared, for example in the form of the integrity of the water sector. This first occurred at the 6th World Water Forum (Marseille, 2012), where the OECD Water Governance Initiative was adopted. Of the six objectives of the initiative, one proposed that by 2018 thirty countries should support the application of the integrity approach in the water sector. Consequently, the OECD Ministerial Council adopted the principles of water governance (Figure 6) in 2015.

[10] U.S. Department of Justice, Office of Justice Programs, National Institute of Justice – NIJ.gov.

Figure 6
OECD principles on water governance

Source: OECD, 2015

The diversity of the guidelines also suggests that there is no one-size-fits-all solution to water challenges worldwide but rather a menu of options arising from the different features of the countries. It should also be noted that the source of the guidelines is in the principles of good governance, where integrity and transparency are basic requirements.

The *integrity of water management* means the application of values, principles and norms which are essential from the viewpoint of water supply and managing water sources. As can be seen, *this integrity is a broader concept than the one used in connection with anti-corruption* as it embraces three important correlating areas. These are:

- *transparency,* which enables openness and clarity in relation to political and professional decisions affecting the sector;
- *accountability,* which ensures that stakeholders have to report concerning the political, administrative and financial dimensions of water processes; and
- *engaging stakeholders* in devising water policies and in the implementation processes of such policies (OECD, 2014).

This broadly interpreted integrity is expected to contribute in large measure to eliminating or lessening the gaps (Figure 7) which are constant accompaniments to water management, as was recognized, among others, by the 2013 Budapest Water Summit. In this sector the importance of strengthening integrity is increased by sector-specific circumstances such as the capital-intensive nature of development especially regarding budgetary investments; the large number of stakeholders; the resulting asymmetric difference of information related to conditions and financial options for the participants, and the high degree of monopolization in the sector.

Figure 7
OECD's multi-level governance framework: "Mind the Gaps, Bridge the Gaps"
Source: OECD, 2011

Security assessment of the National Integrity System

The comprehensive assessment of the National Integrity System from the viewpoint of security can be conducted using two approaches. One is based on the institutional concept of the *National Integrity System (NIS)* devised by Transparency International, and the other, as a new methodological proposal, on the evaluation of the standard of service of performing state functions and duties.

National Integrity System

The purpose of the NIS is to enable Transparency International, and mainly its national integrity workshops, to comprehensively assess the given country's system of integrity. The NIS country case studies are based on 13 pillars (institutions) which are the most important components of the system of integrity (Figure 8).

Figure 8
The components of the system of national integrity

Source: Transparency International, 2011

The authors of the studies, partly using information of key importance gained from in-depth interviews conducted with participants, assess the components (institutions) from the following three aspects:

- *the soundness of institutional capacities:* resources and the legal status of the institution forming the basis of institutional efficiency;
- *internal management rules and practices:* with special attention to the ability of a transparent institution functioning in an accountable and fair manner to prevent the development of corruption; and
- *the institution's ability* to adequately perform its duties related to action against corruption, in other words, whether it ensures efficient control by the government (legislation) and acts against corruption cases (executive power, law enforcement agencies).

The *institutional analysis* following these aspects (dimensions) is embedded in the comprehensive political, socio-economic and socio-cultural conditions in which the governing institutions operate. Based on the necessary data for this gathered from several sources and using several methods (qualitative research tools, document analyses, in-depth interviews, etc.), the researchers determine the point values of the classifying indicators (about 12 indicators for each pillar) used in the course of the analysis, thus enabling the research groups of countries to form their positions with regard to the scores, check their validity, and formulate priorities and recommendations for the institutions and political and lobby organizations to strengthen the anti-corruption fight. National integrity studies with this approach and of this nature are currently being made in almost one hundred countries worldwide. They can contribute to security considerations by indicating the degree to which each pillar preserves and protects integrity.

Assessment of the performance of state functions

The assessment considering the standard of performance of state functions and priority tasks compares the effectiveness of performing certain state functions (Table 7) and duties with the value of a specific and acceptable norm (sustainable development strategy objectives, programmes), and provides an assessment classifying the security of state functioning based on whether the actual standard of service corresponds with, falls behind or exceeds the value of the norm.

In performing this task, special attention is given to the domestic and foreign professional conditions and circumstances influencing the performance of state functions and tasks on the one hand and to identifying weaknesses important from the aspect of the changing security environment on the other. The following reasons may appear among factors causing the fragility of state operation:

- the unfavourable effects of economic and financial crises and crisis management solutions on income, employment and society;
- *large* difference in income between groups of the population that is s*ocially unacceptable* (e.g. between the lower and upper income fifths);
- the large-scale shortage of capacities ensuring community satisfaction (health, education, etc.) services;
- the insufficient nature of community (e.g. water) services even if the requisite capacities for producing state services are available, only in their use the state institutional system does not take the population's requirements into account;
- apart from formal state institutions, non-formal institutions also exist but the borders between their activities as regards the public and private sectors are not regulated, which hinders efficient cooperation (OECD, 2009);
- the government lacks necessary public support;
- the impact on individual countries of unexpected extraordinary international events (e.g. international sanctions, large-scale unregulated migration);
- unilateral, possibly exaggerated international expectations arising in connection with such international events.

Table 7

State functions and their groups

Minimal functions
Public services
Protection, legality and order
Ensuring and protecting property rights
Macroeconomic management
Providing public health service
Social cohesion (improving the situation of the poor)
Strengthening international (global) cooperation

Intermediate functions
Enforcing externalities in education and training
Enforcing externalities in environmental protection
Ensuring the appropriate quality of education
Regulating competition and monopolies
Providing pensions, family and unemployment benefits
Activation functions
Strengthening competitiveness
Income redistribution
State (financial) control

Source: Own compilation

Destabilization processes potentially threatening security can be detected and identified using diverse and continuously conducted risk analyses based on the above and similar aspects. Risk analyses can be particularly efficient if they extend to state functions and the range of the most important related state duties in addition to actual well-defined security vulnerability situations.

In order to be able to define measures to reduce or eliminate the weaknesses identified from the viewpoint of security in the previous phase, *the functioning integrity management system's ability to perform from the aspect of security must also be assessed,* in other words, whether the system is suitable for counterbalancing the weaknesses by adapting or regrouping its tools and processes. The findings of the survey are indispensable for judging the areas where and the extent to which executive decision-making can be effective.

Inasmuch as the current tools and processes of the integrity management system prove to be insufficient for counterbalancing the weaknesses, *the introduction of the necessary new tools and processes* and their order can *be determined* based on the *difference* between the performance of the functions compromising security and the maturity of the management system. In the course of this, the expedience and proportion of the application of rules-based and value-based tools requires separate consideration, paying special attention to the environment of state functions and key tasks.

An expert survey conducted in 2008–09 in the Research Institute of the State Audit Office to classify the performance of state function groups using the Delphi method, for example, produced the result that the standard of such important functions as social cohesion (improving the situation of the poor), macroeconomic management, and the provision of education and a public health service lagged significantly behind the social and government norms. This circumstance also had a considerable impact from the viewpoint of national security over the past years.

The application of the security and integrity assessment methodology employed in this way allows a programme strengthening and developing security to be devised that fits into the frameworks and forms an integral part of state building. In this way the question of security is turned into a public issue in the broadest sense by organically linking the public, business and private sectors.

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Zoltán Szenes

Military Security Today. New Threats, New Wars, New Theories

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Abstract

This study examines theoretical and practical issues of military security from the perspective of new threats, new wars and new theories. The defence of a country is determined by the type of defence strategy it chooses to protect its sovereignty and values, to prepare the armed forces and to manage the military and security risks. Today's modern, post-modern and pre-modern wars and conflicts are different from the ones fought in the 1990s; paradigmatic changes occurred in 2001 and 2014, reflected in fourth-generation warfare and hybrid wars. New theories have been created and developed to understand and explain almost all the dimensions of armed conflicts and violence. The study argues that the changing security environment, the new role of military forces and the complexity of hybrid wars require multidisciplinary research.

Keywords: military security, war theory, hybrid war, asymmetric warfare, fourth generation warfare, military technology

Introduction

After the terrorist attack on the United States, the US Intelligence Community (NIC 2020 Project) outlined four scenarios for world development by 2020: Davos world, Pax Americana, a New Caliphate and Cycle of Fear (NIC, 2004). The first scenario focused on economic development, the second on preserving the dominance of the US, the third scenario focused on the role of radical religious political movements affecting the global system, and the fourth scenario projected the coming of a new Orwellian world due to the proliferation of violence. All the scenarios were permeated by *the importance of security in the future*, although political, economic, social, environmental and *military security issues* appeared to vary in importance in each of the scenarios. American futurologists have emphasized that the trends that determine the future world will not be clear but mixed, and will contain many insecurities, unpredictability and surprises.

The past ten years seem to have proved this forecast, and perhaps even the authors did not expect the vision outlined in 2004 by the researchers to be completely fulfilled. The global financial and economic crisis in 2008 dispersed the "Davos ideas" of the worl's steady economic development. The United States has grown tired of the global war on terrorism, wanting to preserve its economic, military and technological superiority as a "the frugal superpower" (Mandelbaum, 2011: 9–33.). The role of political Islam in the world has gained strength, but the spread of jihadist terrorism (the Islamic State and other terrorist organizations) is threatening not only the developed West, especially Europe, but also the peace and development of the Islamic world. The world of armed conflicts and wars, terrorism and insecurity are increasingly centred on the *geographical axis of Central Asia, the Middle-East and Africa*. Assessment of world order and the operation of the international system have become increasingly pessimistic: the era of "big solutions" has been replaced by the era of "mess" followed by the period of "crises of unprecedented proportions". Today's international literature speaks of a "competing", "disintegrating" and "chaotic" world.

Although the assessment of the international order is often subject to debate, since there are optimistic and pessimistic evaluations, even conspiracy theories, but it is undoubtedly the events of recent years that embody *a combination of the four scenarios.* Today, the events of the world and the state of international order are changing rapidly and unexpectedly, situations are intertwined, separated, interconnected, and emerging in a new way and new capacity. The trends of the 1990s, the drawdown of forces, the reduction of military budgets, and the beneficial effects of peace dividends on economic and social development are far from prevalent. The United States has changed its strategy following the intervention war since 11 September 2001: it has tried to solve the crises with the air warfare after the withdrawal from Iraq and then Afghanistan, with the lowest possible land force *("no boots on the ground").* However, the "targeted" strikes with unmanned aerial vehicles and the air operations of the global coalition against the Islamic State cannot force the terrorists on their knees. *In the absence of political solutions, limited warfare has not led to sufficient results:* Afghanistan is held by the international community on a "respirator", Iraq defeated the ISIS but the disintegration processes have intensified. A paradoxical situation has come about: as a consequence of the war on terrorism, even more dangerous terrorist organizations grew out of the partially destroyed and disorganized Al-Qaeda (which was also predicted in the NIC report), and new, lasting forms of asymmetric warfare have emerged. The international community could not cope with the events of the Arab Spring, as a result of which new flashpoints emerged in the MENA region: there is a proxy war in Syria, Libya has fallen into chaos, and heavy fighting in Yemen is under way. Although there are no major military conflicts in the Asia-Pacific region, North Korea's "sabre-rattling", the disputes around the islands in the South China Sea and the struggle for power result in increasing military expenditure and the modernization of the armed forces, which creates new tensions. Asymmetric warfare represents *a multifaceted image of the war,* where modern warfare comes into conflict with traditional warfare, modern weapons are proliferating, a big number of non-state actors involved in the conflict is increasing, the security environment is fragmented regionally and locally, and the presence of foreign (European) fighters in the army of the Islamic State changes the civilizational and cultural image of the war.

The Westphalian state system is increasingly exposed to challenges presented by sub-state and trans-state adversary forces. Modern, high-tech Western armies have been

confronted with well-organized terrorist armies, ethnic paramilitary forces, separatist groups, globalized networks of organized crime, and the hostile environment of the weak, failed states and rogue states. With the Russian aggression against Ukraine in 2014, the war once again returned to Europe: the vision of a "united, free and peaceful Europe" is moving even further away, with serious security challenges, risks and threats to be faced. With the re-annexation of the Crimean Peninsula; with the Russian support of the separatist forces operating "near-abroad"; and with the direct intervention of the Russian and Turkish military forces in Syria, the old historical thinking, *geopolitics,* is on its way to return to security policy. Cooperation is replaced by confrontation and predation, old-new fault lines and classical spheres of influence are emerging, and the use of military force has once again come into the forefront in power politics. The armed conflicts of the multipolar world did not remain within the conventional framework of traditional warfare between the rival states; wars, conflicts and warfare forms have become multicoloured, multifaceted and hybrid, and this requires the performance of complex tasks by the armed forces.

At the same time, the international security system (with the exception perhaps of the activities of the G20 grappling with the consequences of the economic crisis) has not done well in recent years. The collective ability of solving common crises and problems has weakened, a tragic example of which is the war in Syria going on for seven years. Although UN peacekeeping activities are constantly improving, the UN Security Council – due to the differences in the interests of the big powers – fails to pass a decision; it acts as a "lame duck" in the rapidly exploding, difficult crises. The issues of European security belong to too many international actors (United Nations, European Union, NATO, OSCE, Council of Europe), tasks and competencies are divided, cooperation is not always effective, and the above actors lack the ability and intention to make decisions rapidly with regard to the exploding crises (the Ukrainian crisis, mass migration). The security architecture on other continents (the African Union, the Gulf Cooperation Council, the Rio Treaty, the Shanghai Cooperation Organization, ASEAN) is not strong either because the emerging Great Powers (the so-called BRICS countries or the GCC's capital-rich Arab states) "invest" much less in global security governance than they should. To improve international security requires the cooperation of many global, regional and local forces, because failing that it will be difficult to stop negative trends. Instead of the unpredictability of foreign policy, it is necessary to rebuild the international system to which the concept of order is to be developed, firstly, in the different regions and then the regions should be linked according to rules, with international cooperation and not with violence (Kissinger, 2014: 379–382.).

It is difficult to construe wars, military conflicts and armed violence taking place in our world because "new" wars are often *fiercer, more dynamic and more complex* than those fought in the twentieth century. Representatives of a number of disciplines all over the world seek answers to the new questions. What does military security mean and what is the image of war in the 21st century? Can military forces in this competitive and conflicting global world play a conventional role established in the past? Will Western military superiority survive in an era in which democratic civilization is extremely vulnerable to unexpected, novel and asymmetric threats (terrorist attacks, migration, piracy, etc.)? What role does military force play in combating hybrid threats?

To answer these questions, this paper looks at complex processes, phenomena and events primarily from the point of view of military security. The security theory approach

is based on the conviction that trends can be outlined applying multifaceted analysis to help assess future challenges.

We will be discussing four topics. *First,* we clarify the theoretical questions of military security, the role of military security in comprehensive security, and the new tendencies in external and internal security. *Then* we analyze the strongly fragmented international military security situation from the 2000s with the aim of identifying the most important characteristics of waging war and the development of armed forces. *Thirdly,* we give a survey of war theory in the period following the cold war and identify the main streams of the development of military thinking. Finally, we present an "inventory" of changes in warfare modes that have to be reckoned with for security studies and military science in the coming decades.

The theoretical approach to military security

Military security is "the ability of governments to maintain themselves against external and internal military threats" (Buzan et al., 1998: 50.). In an objective sense, it measures the threat against acquired valuables; in a subjective sense, it measures the lack of fear, in the belief that these valuables will not be put to threat. States take measures to avert military and non-military external and internal threats. A country feels safe if it is not in direct danger, no one and nothing is threatening its existence, operation, and values or, if it becomes necessary, can defend itself and achieve victory. As states operate in an anarchic international system (there is no world government), they are "doomed" to provide their own military security. *Therefore, the essence of military security has always been the ascertainment and management of a real or potential military threat posed by other states in such a way as to acquire the effective capabilities needed for prevention or resolution.*

Military security depends on a number of factors:

1. the agenda of military security (determining the relationship between external and internal security);
2. a reference subject whose security is examined (state, international organization, social group);
3. securitization actors (army, police, secret services, paramilitary organizations, etc.);
4. functional actors (actors of the defence system);
5. the perception of threat and vulnerability (weakness);
6. the security dynamics becoming regional.

Based on these factors, the state elaborates its defence strategy, shapes its military policy, and develops the armed forces.

War is the ultimate means of maintaining military security. War has always been a key topic of international relations, and it has a central place in security studies. Security theory has always recognized the Clausewitzian view on war that war is just as rational a political instrument as diplomacy or economic sanctions: it is the continuation of politics by other means. War therefore is an act of violence intended to compel our opponent to fulfill our will" (Clausewitz, 2013: 39.). Of course, war *is a too risky option* for the state to often use this tool to preserve its security. In 70% of the wars of the last two hundred years, the

countries that started the armed struggle won. But if we divide the two centuries into fifty-year periods, the chances of victory for the stronger party were steadily declining. Warfare became more and more risky and indirect strategies for breaking the will and the fighting spirit of the enemy came to the forefront. In the first half of the 20th century, only 65%, and during the 1950-1998 period only 45% of the countries starting a war were victorious (Arrequín-Toft, 2001: 5.). Although no such analysis has been made for this century, it is not difficult to anticipate further continuation of this trend in the US wars in Afghanistan and Iraq. The number of wars and military conflicts declined further in the 21st century, but after 2014 it does not seem that military security has lost its significance.

States can ensure their military security in five ways:

1. unilaterally, with their own military force;
2, multilaterally, by joining an allied system;
3. unilaterally or multilaterally, by possession of weapons of mass destruction;
4. unilaterally, through neutrality; and
5. by unilateral, unique solutions, by "buying into" international treaties (Collins, 2010: 169–184.).

All political-defence strategies depend on a specific situation, conditions and choices, having their benefits and disadvantages. Although some military security solutions can in principle be separated, but in reality, in the case of a particular country they emerge not in pure form, but in combination, in the simultaneous use of multiple methods.

Table 1

The strongest military powers in the world

1. United States
2. Russia
3. China
4. India
5. France
6. United Kingdom
7. Japan
8. Turkey
9. Germany
10. Italy

Source: GlobalFirePower 2016, Military Balance 2016

Only the strongest military powers can ensure their defence unilaterally, relying on their own forces, although their security and defence policy does not lack the opportunities and obligations of joining an alliance (Table 1). According to assessments in the relevant literature, even the top ten of the world's armies are of varying strength and quality. The United States has the world's most powerful armed forces, *with all the characteristics of military with dominant capabilities* (high-tech quality, partially robotized; joint services, networked in nature; volunteer and professional, knowledge-based), capable of conducting fourth generation warfare. Russia, China and India have high-quality, partly automated,

service-specific, conscripted armed forces with *asymmetric capabilities* that are capable of fighting third and fourth generation armed struggles. The Western countries (France, the United Kingdom, Germany and Italy) and Japan have *partially dominant* armed forces with limited capabilities but may be able to participate in third and fourth generation clashes. Turkey has a strong army with *symmetrical capabilities*, which is a conventional conscripted armed force capable of traditional, second and partly third generation warfare. The overwhelming development of the military power of a major power may pose a threat to neighbouring countries, it could break regional security, launch a spiral in the arms race, which could lead to a *security dilemma* (Herz, 2003, Jervis, 2011, Gartner, 2007). However, development and production of state-of-the-art military equipment can only be achieved by countries with the most advanced economy and technology.

The militarization of a country can have a wide variety of international effects; it is not just about arming, "violent peace", but also the pursuit of power-driven, authoritarian or oligarchic politics in the international arena and in domestic political life. The nation that arms itself has to contend with other actors on the international stage, with international organizations, with allies and partners. The changes in the boundaries of military security have to be accepted by domestic political forces, civil institutions and society. From the government's point of view, the imagined threats can come from the bottom (from various social groups), from the top (massive threats), but can come from outside (mass migration) and from inside ("traitorous" political opposition, "extraneous" minorities), which all have to be accepted by the public. Military security must protect all national weaknesses that can be exploited by the enemy (resistance fighters, terrorists, secessionists, saboteurs, etc.). This calls for re-regulation of the internal legal order, national security, state operations and the life of society, finding a balance between new threats and human rights. *But military power is a relative tool for solution in all situations where the state is trying to use it.* American president George Bush, for example, was mistaken in holding that delivering a crushing military defeat to the Talib regime or removing Saddam Hussein from power would result in a fatal blow on terrorism. It is impossible to know how the world would have changed if the president had chosen a political solution instead of military retaliation to address the threat. What we know for certain is that, as a consequence of the US military intervention, terrorism, both in terms of scale and quality, has entered a different phase, It has become a force to shape and influence international security: in the course of the "long war" even the United States turned to its allies for support. Fighting against the Islamic State has made it necessary to establish a global coalition under the leadership of the USA, currently consisting of 73 countries and 5 international organizations.

A prevalent mode of ensuring multilateral military security is *joining a military alliance* of some kind. Alliances are diverse and differ from each other in the cause, purpose and place of establishment, the military commitments, the number of participating countries, their geographic area, the level of integration of the military forces, the partnership policies and many more. Military alliances can be established for a single occasion (for war, for a campaign, for a military mission), or for a *permanent*, long-term strategy. States choose membership in an alliance if they believe their military capabilities are limited and they are inadequate to counter a potential threat. They believe that by joining the alliance they will increase the alliance's power and deterrent to ensure the country's security in the event of a military conflict. Allied formation is especially important when a potential hegemonic

power threatens other states in the international system. It is by no chance that countries now on the western border of Russia are asking for enhanced military protection from NATO. Alliances are often linked by security theory to the theory of balance of power, because by joining an alliance "automatically" they want to counterbalance the threat of a potential adversary state (see, for example, the establishment of NATO) (Walt, 1997). Others argue that small states will join the regional military alliance even if there is no threatening power, merely using "bandwagoning" in the hope of benefits or they are afraid of missing out on an opportunity (the Treaty of Rio).

A well-functioning military alliance is undoubtedly a useful solution for states, since they do not need to sustain a military force above their economic means, and they can take into account the benefits of division of labour within the alliance (e.g. NATO's *Smart Defence* concept, EU's *Pooling & Sharing Initiative*). However, membership in the alliance also has problems that can be found in different interests, decision-making, burden sharing, and in the alliance-conform development of forces (following the example of large countries). Theoretical and concrete *ad hoc* discussions within the alliance should, however, not be exaggerated, since they are part of the problem of cooperation within the alliance. The literature of security theory (Snider, 1984) has already revealed the interconnections of the security dilemma within the operation of the alliance's complex value and interest system in the 1980's. This is especially evident in NATO's activity in the context of the Ukrainian crisis. The operation of the transatlantic alliance has always been *characterized by a balancing act* between participation in the alliance's missions (*entrapment*) and failure to keep the alliance's promises (*abandonment*) both at community level and at individual member states' level. If the organization fails to provide adequate assistance to a threatened member state, the state concerned feels abandoned, "an orphan", and this raises the issue of solidarity and credibility. The guarantees of Article 5 are also inflated if the NATO member requesting help does not receive the assistance guaranteeing its security. On the other hand, a state not specifically concerned with a security threat will consider the degree to which it gets involved in a conflict important from the alliance's perspective but marginal from the perspective of its own national interests. It may be able to avoid situations of entrapment by not delegating forces to conflict management, by not taking part in the operation foreseen, but it is not certain that it will not "lose on the swings what it gains on the roundabouts". If the alliance does not find the way to solve the problem, it can be easily discredited, lose relevance, ultimately risking its own future. So, helping those who are in trouble and feel threatened is an exceptionally important task because the expression of solidarity sends the message to the country concerned that it can count on the alliance. This is clear today when the 2014 NATO Action Plan (Readiness Action Plan, RAP) was unable to change the Russian aspirations but still had a reassuring effect on the countries of the eastern wing of the Alliance (minimal deterrence).

According to critical military studies, alliances do not add much to the military security of a given state, but by their very existence and their decisions they make the operation of regional security architectures and the co-operation of international organizations difficult. Others think that the balance between the alliances has a positive impact on peace and security as long as the alliance's strategy is subject to renewal, its organization and operation are flexible, and the alliance's obligations function as a bond between the member countries. Nevertheless, many states in the world today do not wish to associate with military alli-

ances because they feel that the commitments and risks to undertake would outweigh the potential benefits, gains or they avoid membership because they do not wish to enter into military cooperation with the leading Western powers. The largest group is the Non-Aligned Movement (NAM) of non-aligned countries, where one of the membership criteria is that the country aspiring for membership cannot be a member of any regional or multilateral military alliance that can be linked to the Cold War era confrontation of the great powers. NAM countries build military security by leveraging national capabilities to draw on the collective self-reliance of developing countries.

Defence based on weapons of mass destruction is nowadays becoming *less and less of a realistic option to guarantee today's security,* as there is a strong international regulation to prevent the proliferation of weapons of mass destruction (N. Rózsa–Péczeli, 2013) which does not constitute a real alternative. Today, nine countries have nuclear arsenals (Table 2), and at least a dozen have biological and/or chemical weapons (James Martin Center For Nonproliferation Studies, 2008). International conventions not only include the fact that signatory States relinquish the right to possess and possibly use nuclear weapons but have also announced their intention to prevent by all means at their disposal the access to nuclear weapons by other states. In the fight against nuclear proliferation, the *US plays the leading role* by offering a protective nuclear umbrella for its allies not in possession of nuclear weapons (Japan, South Korea, NATO, and Australia) in exchange for their relinquishment. After the Cold War, the prevention of the proliferation of weapons of mass destruction became *the top security policy priority* of the great powers (essentially the permanent members of the UN Security Council). With the help of the United States, the nuclear weapons that had been left in the former Soviet successor states were dismantled. In 2015, five permanent members of the UNSC and Germany signed a framework agreement with Iran on its nuclear programme in exchange for the lifting of international sanctions against Iran. In 2009, Barack Obama launched a new international nuclear disarmament forum (nuclear summit), where the issues of nuclear disarmament and the coordinated international action against nuclear terrorism were discussed at the Heads of State and Government level (April 4, 2016). This unparalleled international effort resulted in the fact that without the knowledge of the international community it is almost impossible to obtain fissile material and technology for the production of weapons of mass destruction or to employ the appropriate experts. The country violating the treaties (see the cases of Iran and North Korea) faces severe sanctions (economic and financial embargo, possibly a military strike against nuclear facilities – Israel, for example, delivered air strikes against nuclear facilities in Iraq in 1981 and in Syria in 2006), the negative consequences of which are not in proportion with the deterrence capabilities expected of the possession of weapons of mass destruction.

According to the 2018 data of the Stockholm International Peace Research Institute (SIPRI), nuclear powers today have a total of 14 465 nuclear warheads, of which 3750 weapons have been deployed. Although this is a modest reduction of 3% compared to 2016, nuclear weapons continue to play a decisive role in deterrence, and they are still being modernized. The production and maintenance of weapons of mass destruction is very expensive. According to US data, one state-of-the-art nuclear bomb will cost USD 20 to 200 million, and the production of delivery systems will cost even more. The cost of biological and chemical weapons (the "poor man's weapons") ranges from a few hundred thousand dollars to several million, and their production is not easy either. Additionally, the state must maintain the

conventional armed force, so it is important for the state leadership to think twice before it wants to maintain nuclear and conventional deterrent forces at the same time to guarantee its military security.

Table 2
Nuclear powers

Self-declared nuclear powers
• USA (1945)
• Soviet Union/Russia (1949)
• United Kingdom (1952)
• France (1960)
• China (1964)
Verified nuclear powers
• India (1974)
• Pakistan (1974)
• North Korea (2006)
Presumed nuclear power
• Israel (1967)

Source: SIPRI, 2018

The fourth way to create military security is *to declare neutrality* when a state, by using international legal options, bases its defence concept on its neutral status (military neutrality). International law recognizes two types of neutrality: *wartime neutrality* and *permanent neutrality* (Kussbach, 2009). A neutral state in times of war must refrain from any act of war, it is bound to keep an equal distance from all the forces taking part in the war, but at the same time it can perform good offices to the warring parties. The content of wartime neutrality has changed somewhat with the establishment of the United Nations, as UN members cannot demonstrate impartiality towards a state breaking the peace, committing acts of aggression and towards the victim of aggression. The decisions on sanctions taken by the UNSC must also be enforced by a neutral state and under collective security must provide assistance to the State under attack. The essence of permanent neutrality is that the state is obliged to stand in an impartial manner not only in times of war, but also in peacetime, and cannot join military-defence alliance systems. Permanent neutrality is mostly guaranteed by international treaties or conventions, but there are countries that pursue traditionally neutral policies without such guarantees.

Currently 22 countries have neutral status, but their motivation is diverse. The smallest countries have confidence in neutral status because they think they are not important enough to influence any conflict, so war is avoided. In this group, the strategy of "laying low and staying unnoticed" prevails. Other countries declare neutral status because they want to counterbalance the possible military threat of the neighbouring powers. Finally, the decision of the states that chose to declare neutrality after the Cold War, was influenced by an overwhelming historical past, so, after the former forced membership in an alliance, all they wanted to do was remain independent. It should be noted that the idea of neutrality was seriously raised in Hungary during the change of regime. Historical experiences, however,

show that *neutrality is only feasible when actors in a particular conflict/war recognize the existence of the status.* This recognition, however, is almost without exception based on power interests of the moment, and when the interests change, the status of neutrality is questioned. Today we know that the oldest neutral country, the traditional neutrality of Switzerland, depended on chance during World War II, because on two occasions Hitler planned to occupy the country. Declaration of neutrality in 2010 did not help Ukraine, either, because Russia did not respect the existence of the status along with the change in the political situation. For many countries, being a member of a regional political organization such as the European Union which has a common security and defence policy also weakens neutrality. However, it seems that these risks are also being recognized by neutral countries, and they also maintain *their own army* under the principle of "Trust in God and keep powder dry" (Oliver Cromwell). The legendary neutral Switzerland has a peacetime strength of 20,800 of her conscripted armed forces, supported by 148,500 well-trained and equipped reserve personnel and 70,000 civilians in the territorial defence concept. Of the 22 neutral countries, a total of four countries (Costa Rica, Liechtenstein, San Marino, and Panama) have no military power of their own. The "cheap illusion" of neutrality is denied by the 2018 GFP index, as we find Japan (8th place), Taiwan (24th place), Ukraine (29th place), Sweden (31st place), Mexico (32nd place) and Switzerland (34th place) among the 50 countries with the strongest armies. All this reinforces the conviction that not even military security based on neutrality *can do without* armed forces with adequate capabilities to ensure the survival of the nation.

Table 3

Countries that have been neutral for the longest

• Switzerland (1815)
• San Marino (1862)
• Liechtenstein (1868)
• Sweden (1918)
• Vatican City (1929)
• Ireland (1937)
• Mexico (1939)
• Japan (1947)

Source: www.adducation.info

Finally, military security can be ensured by a *combination* of the above methods, because, as we have indicated in the individual cases, there is no clean-cut solution. For example, critical military studies call for the waiving of a traditional defence concept, suggesting a transition to a professional non-traditional force (Fabian, 2013). Perhaps solutions of the countries following a military security policy without standing armies can be considered to be in line with the liberal concept of security and provides a good example for the reduction of demilitarization in the world. According to CIA statistics, 16 countries at present have no army at all, but this does not mean that they do not have paramilitary forces (special subunits, coastguards) within the police responsible for interior security (Gilsinan, 2014). For example, the security of Vatican City has been provided by the legendary (now 110-strong)

Swiss Guard for 510 years, but it is now considered a military parade unit, and the real protection is guaranteed by the Italian armed forces. Most of the non-armed countries are mini-states (island or mainland states) and all have their own history of "being unarmed".

A classic example in the literature is Costa Rica, which abolished its armed forces for fear of a possible military coup in 1949. In many countries that gained independence, it was obvious for them to seek military protection from a former colonial country or a protectorate. However, it is common for all these countries that they are located in *regions not afflicted by invasion and war* (the Caribbean, Oceania, and Europe), so a security solution without their own armed forces seems logical. The protection of countries without military force is endorsed by a power (USA, Spain, France, Australia, New Zealand) located close to country concerned, on the basis of the bilateral agreements or relying on a regional security arrangement (Iceland, for example, is a member of NATO), or an informal cooperation (in Vatican City, Italy, for instance) guarantees the sovereignty of the state. Although security solutions without maintaining armed forces appear to be inexpensive, they are not free: the countries that are protected must contribute to the cost or otherwise compensate the country providing defence.

After World War II, *security was for a long time equal to military security,* and the non-military arm of the security scissors began to open only from the seventies. The dominant military security in the theory of international relations was primarily concerned with the problems of *military confrontation,* armaments, *nuclear deterrence* and *power projection.* Military security in security theory was considered so general that it was almost *identified with strategic studies* that investigate the role of military power in the context of attainability of political goals. The realistic view typical of the bipolar world regarded the states as individual entities that provided "collective goods" to their citizens, including the "public good" called security, the most important of which was the protection from external attacks. The obligation of a state to provide military security is still valid, because if a country is unable to protect its citizens (think of Ukrainian citizens living in Eastern Ukraine), its sovereignty, operability is threatened, a lack of security emerges, ceding ground to non-state actors (in the case of Ukraine: secessionists sponsored by Russia) to operate in the security vacuum.

After the Cold War, the concept of security was enlarged with the topics of political, economic, social and environmental security, but all security theory trends – realism, liberalism, and constructivism –, included the study of military security (Gazdag, 2011). Although military security over the past decades have seemed to be pushed into the background compared to other sectors, events have repeatedly proved that *military security has an important role in the wider security concept.* For this reason, military power remains a major issue in the governmental policies of nation-states because a state and society can feel safe in their political, economic, social and environmental dimensions from their own perspective, but these results can be ruined in the face of a military defeat. The tragic events of 2014 (Russian intervention in Ukraine, the successful occupation of areas by the Islamic State in Syria and Iraq) *confirm today the pertinence of the theorem.*

Armed forces, however, have not only the ability to defend the country from external attacks, but they can be used as a foreign policy instrument (an aircraft carrier is called simply "90,000 tonnes of diplomacy" in the relevant literature), as well as for internal defence purposes (counter-terrorism, disaster management tasks, border protection, support for civil authorities, etc.). The real tasks of the armed forces appear in government policy,

in national security and military strategies, in doctrines and in law, they are expressed in military budgets and in the objectives of the sustenance development of the armed forces. Military security, like security in general, can be objective and subjective. In the objective sense, the military threat to the state and citizens is linked to the threat to the existing values that they see, feel and understand; in the subjective sense, there is a lack perception of threat and the fear of fundamental values being attacked. This ambiguity of security gives states large room for manoeuvre to influence the objective and subjective perceptions that are often achieved through securitization. Securitization describes a process that creates a situation where the government or other political actors treat a particular event as an existential security issue whether or not it is realistic, or it is only considered to be realistic in order to take urgent and extraordinary measures to end the threat (Gartner, 2007: 178–179.).

After the Cold War, *military security is increasingly intertwined with human security,* because military interventions, "expeditionary wars" and humanitarian operations, despite all intentions, are accompanied by major destruction, losses in population, waves of refugees, and emergency situations affecting masses of people. Under the pressure of the United Nations, states are required to develop a "defence culture" which prepares the military force not only for the achievement of military objectives, but also for "peace-support", "peace-building", "state-building" and "nation-building" missions as well. Therefore, modern military policies are already preparing a *dual approach* for the armies to accomplish future missions: the "Rambo-type" combat missions and the "armed social worker" type of missions. This philosophy has developed a lot in the peaceful multipolar world, leading to Western-type forces increasingly becoming socialized for expeditionary operations. The shift from combat missions to peace-building missions was promoted by all major international institutions (UN, European Union, NATO, OSCE, African Union, and ASEAN), the need for a network-based or comprehensive security approach, the establishment of joint military and civilian (police) forces has come into the foreground. Although a number of initiatives have been implemented (UN, EU, NATO) in this area, a breakthrough has not been achieved, most well-intentioned proposals remained on paper. In 2004, the EU, for instance, planned to establish a new type of integrated *human security response force* (15,000 strong) in peacetime, one third of whom would have been military, one third police and one third civilians (development professionals, lawyers, social workers, teachers etc.) (Barcelona Report, 2004).

However, such solutions typically require consensus in all international organizations, which is difficult to achieve because of differences in interests and lack of resources, often resulting in failure to make decisions. However, it is clear that the Barcelona proposal is professionally well-founded because such a mixed security force would be able to provide all EU missions today.

However, implementation is hindered not only due to political problems but also due the resistance of international civil organizations and their low level of willingness to co-operate. Social organizations (INGOs, NGOs) see integrated solutions and comprehensive approaches as the "militarization" of other sectors of security. The end of the peace-support operation of NATO's ISAF (31 December 2014) shows that the concept of a comprehensive approach in the new Resolute Support Mission (RSM) of the Alliance has been *toned down to a modest coordination* between the international actors and the government and actors of local civil society. However, the Ukrainian crisis has pointed out that due to the "civil-

ianization" of foreign military operations, *serious deficiencies have arisen* in preparing for traditional wartime missions.

Research also points out that *strategic culture* prevailing in a country, that is, the perception, the way in which that country creates, regulates and implements its security and defence strategies, plays an important part in the perception, regulation and provision of military security and the mission of the armed forces. National crisis management decisions and national "added value" are significantly influenced by historical forms of behaviour, social beliefs or convictions, national myths, political and social norms (Forgács, 2009; Tálas, 2014). It is not in the sense of making specific decisions relating individual crises or instances of co-operation, but on drawing the limits, the "red line" of what the government considers vital and less important, acceptable or unacceptable, feasible or impracticable, urgent or delayed.

Strategic culture has an influence on patterns of behaviour as the government seeks ways, methods and culture to realize its political choices. We have seen positive and negative examples of taking into account national strategic cultures, including in the recent past in policies related to Ukraine, in those related to Russia, or in the European migration crisis. Strategic culture, however, is not only developed at national level, but also in alliances, and this needs to be taken into account in crisis management.

Critical military security studies, however, argue that the missions of wars and armed forces have also changed in the 21st century, and the "real world" today is different from the one in the last century. In the wars against terrorism of our time, military forces use the force primarily for non-classical tasks (the destruction of the armed forces of the enemy, occupying and pacifying its territory), but to pursue and destroy the forces rebelling against the state, the terrorist forces (such as USA trying to destroy the Taliban and Al-Qaeda in Afghanistan; Israel trying to eliminate Hezbollah in Lebanon [1982, 2006], and Hamas in Gaza [2009, 2014]). National forces are involved in operations targeting rebel forces involved in drug trafficking (e.g. Colombia, Mexico) or terrorism (e.g. Iraq, Afghanistan) in a number of countries. Not once they are faced with the fact that terrorists, tribal leaders, criminal clans have already occupied an area, create and operate a "state". The United States leads a global coalition of 73 nations against ISIS, within which 23 nations take part in a "shadow war" with air force and special operations units. The use of military force in this way differs significantly from the realistic concept of war between states, even though military forces fighting rebels (colonization) looks back on a long history. Since combat police forces were established only in the 19th century, the army also carried out the tasks now carried out by the gendarmery-style police forces against smaller terrorist, guerrilla and rebel groups.

The features of international military security

The large-scale political, social and economic changes after the Cold War *resulted in a shift* in international relations, from the state-centric system to mutually interdependent, interconnected and competing international forms of co-operation. In this competition, political, economic and military competition between the great powers and the regions, the strengthening of the emerging countries, the decline of the West, the strengthening of terrorism and the return of geopolitics denote the most important changes. In Europe, Rus-

sia pursuing violent politics, extremist Islam in the Middle East caused surprises. After the terrorist attack on the United States (9/11), the fight against terrorism has become a global war, which now takes on the features of a clash between civilizations and religions (Huntington, 1998). *Paradigmatic changes in security are culminating in the hybrid threat and the hybrid war phenomenon.* The limited military conflicts between states, the globalization of terrorism – and most probably, gaining global ground by the Islamic State (ISIS), deemed to be the most dangerous – have changed the Western perception of security. Antagonisms, tensions and confrontations related to crises have changed the environment of operation for modern states, changed the division of power and labour between states, regions, markets and civil societies, and *brought to the forefront the activities of the armed forces and law enforcement agencies.* It has also become clear that globalization is not a homogeneous process, because, paradoxically, processes and phenomena of convergence and divergence alike can be found in it. In addition to mutual interconnection and global "consciousness", the bridgeheads of polarization, particularism, nationalism, ethnicity and anti-globalism have also strengthened.

Figure 1 shows convincingly the changes in the world, as the number of wars and major military conflicts radically decreased after 1990. It also appears that inter-state wars have almost disappeared after 2010, but the number of wars (wars within a state, between the state and non-state actors, war at the so-called Community level) has also declined steadily in the nineties (60% reduction). After 2001, there was a slight increase, followed by a recession, but after 2010, mainly because of the war in Syria and Iraq, a further increase is visible, which was further strengthened by the Ukrainian crisis after 2014. According to an assessment by the Centre for Systemic Peace (CSP), there were 327 *major military conflicts* following the Second World War, the outbreak of which claimed at least five hundred casualties, and in the protracted armed struggle, at least a hundred people per year died. According to CSP assessments, there are *36 wars* going on in the world at the present.

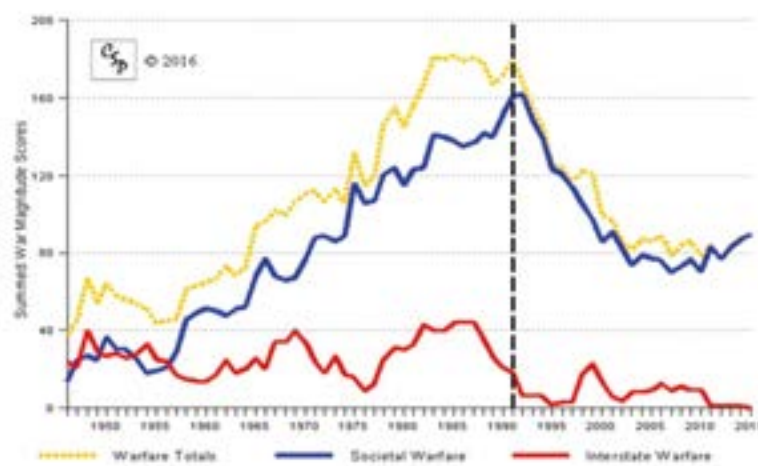

Figure 1
Global Trends in Armed Conflict, 1946–2015

Source: CSP, 2016a

Six of today's military conflicts are still the legacy of the Cold War: Myanmar (1948–), India (1952–), Israel (1965–), the Philippines (1972–), Colombia (1975–) and Somalia (1988). After 2011, *12 new wars broke out,* which dominate international public life today (Table 4). CSP calculations take into account all types of political violence (international intervention, civil war, ethnic war, community conflict, genocide) and calculate the full impact of military conflicts: deaths, injuries, depletion of resources, destruction of the infrastructure, and migration of refugees, changes in individual and social psychological and political culture.

If we focus on organized violence regionally, the Middle East is at the forefront, and Africa – after 25 years – has fallen back to second place. Central and South Asia hold their third position permanently, although there is a rearrangement in the region: while the war in Sri Lanka ended in 2010, ethnic conflicts have decreased in India, Pakistan maintains its usual level, and Afghanistan is again gaining momentum. (At the NATO Summit in Warsaw, in July 2016, a decision was taken on the continuation of the Alliance's mission in Afghanistan.) The number of conflicts in East Asia and America has decreased, even though non-state violence in Mexico has risen. Finally, the conflict list in the continent is closed by Europe, although losses from the war in Ukraine have increased, they are substantially smaller than those in the Balkan wars (Melander, 2015).

Table 4

The most recent wars

2011: Iraq (ethnic)
2011: Syria (civil war, ethnic)
2011: Sudan (ethnic)
2012: Mali (civil war)
2013: Egypt (civil war)
2013: DR of Congo (ethnic)
2013: South Sudan (ethnic)
2014: Libya (civil war)
2014: Ukraine (civil war)
2015: Burundi (civil war)
2015: Cameroon (ethnic)
2015: Yemen (ethnic)

Source: CSP, 2016a

It should be noted that research results largely depend on the research philosophy applied, on methodology and databases. However, the surveys done by another famous institute, the Peace Research Centre of Uppsala University (Sweden)[1] also show that the Canadian

[1] The measurement and rating of military conflicts is not the same for each research institute – it depends on the databases used, the methods of calculation and the threshold limits of the conflicts followed. Uppsala University's Conflict Research Center measures conflicts starting from 25 casualties upward, and draws the lower limit of a *major military conflict* at 1,000 casualties. However, both research institutes speak of war at casualties in excess of 10,000, which is the result of co-operation between institutions. The Norwegian peace research institute PRIO (Peace Research Institute Oslo) also participates in the joint work. See http://ucdp.uu.se/.

CSP results are reliable and even methodologically adequate. The Swedish UCDP measures losses in excess of 25, so the Peace and Conflict Research Centre has already registered *70 organized and violent military clashes* in 2015, which resulted in a total of 118,435 deaths.

Figure 2 shows the regional location of military conflicts, combined with the functioning of the state. The countries in dark bourdon (20–25) show the inoperable or very poorly functioning states (16–19). Orange indicates countries with serious operational problems, and fading shades of yellow only indicate states requiring international attention. This six-grade scale of state fragility is only one method used by international literature. Research centres conducting in-depth research, such as the US Fund for Peace (FFP), present 11 categories, but there is no difference between the evaluation results.[2] For example, the FFP further breaks down the countries marked with dark bourdon by the CSP into two more categories: *in the four failed states and in the majority of the very poorly functioning countries, respectively, there are wars going on.* Somalia is worst off, which has failed in all of the 12 indicators measured. In the Fragile State Index (FSI) the worst-rated countries are at the top, while the well-functioning states are at the bottom. (For example, Hungary is a stable country with 135th place, while Finland is at the bottom of the list in the 178th place.)

The map shows spectacularly the theoretical context that *most of the military conflicts are typical of dysfunctional, fragile or weak states.* But it also points out that in these countries not only the military threat and the lack of internal security are the problem, but that the country is in a deep political, economic and social crisis. While fighting can be stopped relatively quickly through interventions and peace operations, dealing with non-military problems is much harder, it takes much longer, and no results are guaranteed, either.

[2] The FFP evaluates countries according to the following indicators: (1) demographic pressure; (2) the situation of refugees; (3) social group grievances; (4) migration; (5) economic inequality; (6) economic downturn; (7) the legitimacy of the state; (8) public services; (9) human rights and the legal system; (10) security forces; (11) the joining of forces by the elite; (12) external intervention. See http://library.fundforpeace.org/library/fragilestatesindex-2016.pdf.

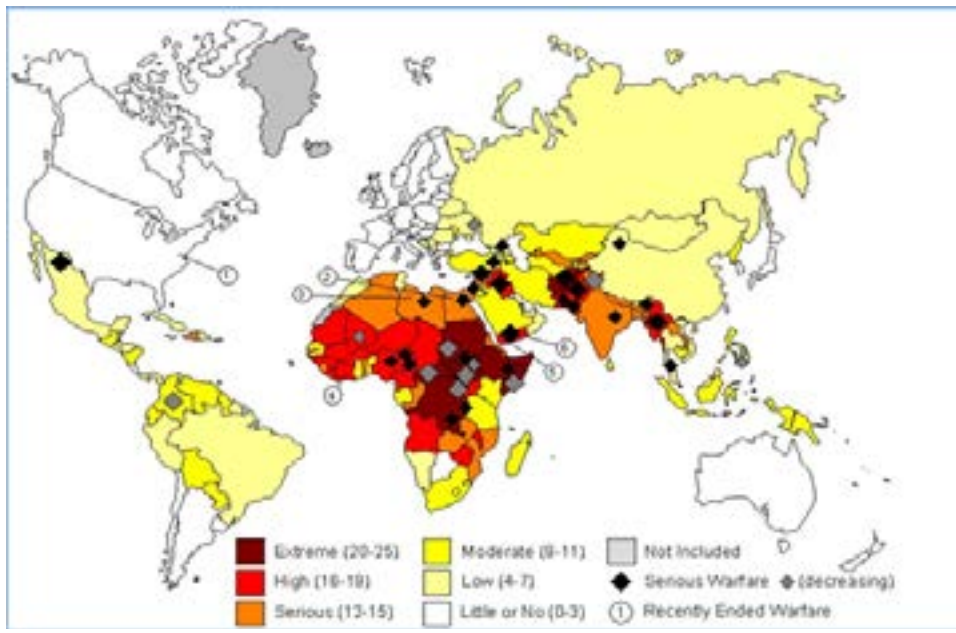

Figure 2
The international military security

Source: CSP, 2016b

With September 11, 2001, the international security system virtually *split into two*: into the traditional 20th century state-centric defence system and into the 21st century, sub-state level, and supranational security layers. The global strategic schism has brought about the erosion of *differences between national and international conflicts, external and internal security, and public and social security, respectively.* In the world of new threats, not only the state but non-state actors (extremist groups, paramilitary organizations, terrorists, international criminals, drug dealers, warlords, etc.), too, have modern arsenals, media and advanced computer systems because they have foreign supporters, so they often wage proxy wars. For this reason, it is difficult to deal with civil war situations, terrorism, piracy, migration, international crime, cybercrime, proliferation of weapons of mass destruction, and economic struggles only at state or regional levels. These threats *jeopardize* not only the sovereignty of the state, but also *the security of entire societies, regions and civilizations*, and become factors influencing international stability.

Among the new types of threats, terrorism, in particular, puts the use of military force to the test. After 9/11, the intervention of the US armed forces and their allies (including NATO in Afghanistan) in Afghanistan and Iraq was a combustible mixture for terrorism, especially jihadist terrorism, which reached its peak in 2007 (Figure 3). The US Department of State now records 61 terrorist organizations,[3] *of which ISIS is the strongest today,* even though its power, territory and resources are more and more tapering off. The CSP

[3] See: www.state.gov/j/ct/rls/other/des/123085.htm

chart shows the most serious terrorist acts (High Casualty Terrorist Bombing, HCTB) in half-yearly intervals, each involving more than 15 casualties. In particular, the number of attacks using "smart bombs" (car bombs, suicide bombers) requiring low technical capabilities and aimed at soft targets (police forces, offices) and mass events (hotels, markets, beaches, etc.) have increased. In the last two years, however, professionally trained terrorist groups ("super-empowered terrorists") and "death squads" capable of causing much more devastation have appeared in Western-Europe. There were 11 (HCTB) terrorist attacks in Europe before the Nice terror attack (July 2016), which claimed 278 casualties. However, most terrorist acts were committed in the crisis belt, where Afghanistan, Pakistan and Iraq belong, followed by Yemen, Somalia, Libya and Nigeria after the Arab Spring. If we include small-scale acts of terror perpetrated with small arms, knives, and cars, we can talk about a much larger number of cases[4]. *Although the frequency and devastating* effect of the terrorist attacks are on the increase, however, they are far behind the similar indicators of political or criminal violence.

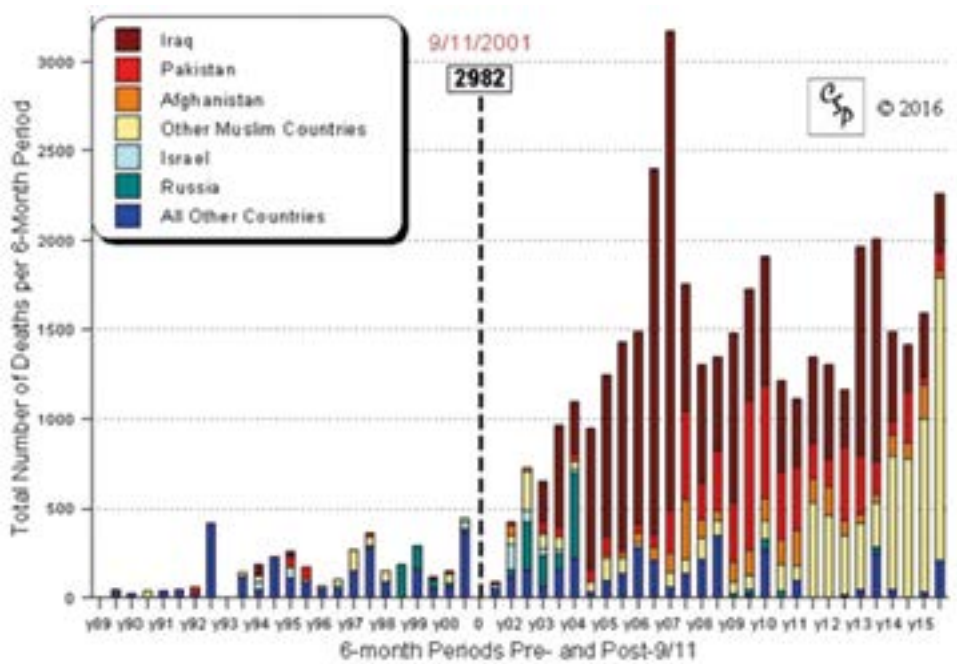

Figure 3
High Casualty Terrorist Bombings, 9/11/89–3/10/16

Source: CSP, 2016c

[4] In the wave of violence that started in September 2015 in Israel (knife attacks, car-ramming attacks and shootings), 21 Israelis and one US citizen were killed in Israel. Israeli authorities and armed civilians killed 139 Palestinians, most of whom were killed in clashes with security forces. See http://eu.euroons.com/2016/01/09/ujabb-keses-tamadas-tortent-izrael.

From the terrorist attacks against the United States to the present day, terrorist acts have claimed 40,860 casualties (only 3,691 from 1990 to 2011), 49% of which occurred in Iraq. The number of victims of political violence after 9/11 was 3.5 million. While the West has found the answer in within traditional warfare in the form of asymmetric operations, in the area of internal security (especially in Europe), successful prognostic, preventive and protective procedures have not yet been established. However, since the attacks in Europe, the development of security forces has begun, and as a part of it, the internal task system and organizational structure of the armed force (support for police and secret services in the event of terrorist threats, border protection duties, military technology, procedures, training provided for law enforcement agencies, creation of military gendarmerie etc.). However, all these steps and the pace of change are not satisfactory, the social roots of terrorism should be eliminated, and this requires the simultaneous, integrated management of the political, social, economic and military components of security, based on the principle of a comprehensive approach.

Changes in the international military security system are reflected in the *changing character* of recent wars and military conflicts, which are described in different ways by foreign and domestic literature. Confrontations after the Cold War, a broad spectrum of wars and conflicts in today's world are characterized differently by various authors. According to the internationally accepted typology drawn up by the British diplomat Robert Cooper, the new world order of the 21st century can best be characterized by *three kinds of states, i.e. a combination of modern, postmodern and premodern state* (Cooper, 2000). The premodern is essentially the world of the weakly functioning countries, *terra nullius* that is no longer needed by the post-developed world, so it does not interfere, so chaos zones are created. The modern world is the domain of the classical state system where old security policies (power balance, the *status quo* and state interests) and mindset dominate. Wars would only arise in this region if the situation threatened the regional security equilibrium (e.g. the first Gulf War). The postmodern world is represented by EU countries, Canada, and partly by the USA and Japan, which operate on the basis of the monopoly of power but of the sharing of interests and values, transparency, confidence building and voluntary respect for international law. Postmodern states reject the use of military force to resolve problems, they work with conviction on the codification of international peace and security, the borders of foreign and domestic policy merge, mutual interference in each other's internal affairs and monitoring are conducted in a regulated manner, and the relevance of borders is reduced. When assessing the security of the tripartite world, the British diplomat underlined that *all three worlds (the zone of European security, the danger zones, the zone of chaos) require different security policies and toolkits. In the postmodern world, security must be built on trust and cooperation.* He pointed out that Russia should be kept in the European Security Zone as far as possible. The world of the modern world operates in the old way, through states, but a military conflict would only take place if the rules of collective security were extremely violated. Therefore, postmodern states can only deal with the problems of the modern world on the basis of a dual value system, "if the fight takes place in a jungle, then the rules of the jungle must be applied". The management of the security of the premodern world (Somalia, Afghanistan, Libya, Iraq, Syria, Sudan, etc.) is the most problematic, since chaos could only be eliminated in an old way (colonization, hegemony), alien to a postmodern state. Chaos cannot be managed by traditional military means, the "by-products" (drugs,

illnesses, refugees, terrorism) must be fought against, but intervention is risky. Managing threats to the premodern world is intertwined with the possibility of failure (*mission creep*). The developed West should function as a sort of "rehabilitation centre" (*halfway house*) and help the population of a country/region hit by the crisis improve the situation and restore state functions. Such interventions are not spectacular, the results are modest, and they pose many risks. According to Cooper, the Clausewitzian strategy does not work in the premodern world, the goal cannot be "victory", and operations require constant political guidance and support. Cooper suggests integration to today's postmodern states instead of nationalism. At the same time, the premodern world can endanger the postmodern state (states) because an unsuccessful intervention weakens the government, and the losses are not accepted by society after a while. In the case of postmodern failure, the *coup de gráce*, the finishing stroke comes along, because modern states "step into" the conflict resolution with the traditional solutions (seizing power, striving after autarchy, upsetting the balance of power, etc.), which in extreme form may also pose a threat to the postmodern region.

The "Cooperian" concept of new world order and security features have been translated into the language of warcraft by Australian experts (Evans et al., 2004). Postmodern war reflects Western views of limited war, peace-making operations, and humanitarian military interventions. Modern war means the traditional warfare between states, the civil war, and unilateral state violence. Premodern war is a mixture of sub-state level and transnational forms of warfare, a combination of conventional and irregular war that national or social groups wage for identity, ethnic goals, based on the traditional politics of extremism and particularism. It is important to note that none of the war types represent a distinctly separable form of warfare, but rather *overlap each other and interact with each other.* In particular, modern and postmodern wars and the mixing of modern and premodern wars, respectively, can be observed in today's interventions, antiterrorist activities and humanitarian operations, which are often associated with the world of asymmetric and ethnopolitical warfare. The essence of these complex interactions is captured by, for example, the US Navy's doctrine of the *three-block war,* which states that teams can participate in a specific operational area at the same time as conventional combat tactics, peace operations and humanitarian aid. But here we can also mention the *forms of Russian nonlinear (hybrid) warfare* when the armed forces have various missions and obligations to cooperate with other power branches of the state. According to my calculations, out of 36 wars and major conflicts today *four conflicts count as modern wars (11%), 13 clashes are of a postmodern nature (36%) and 19 belong to the premodern category (53%).*

Despite the fact that modern, postmodern and premodern forms of war are intertwined, each form of warfare form has its *distinctive features. Postmodern wars* do not risk national security; seldom threaten the survival of the nation, limited war policy goals are achieved without the state taking special risks. Postmodern war is fought by advanced armed forces, but warfare – such as, for example, the air war against Serbia – is based on a deliberate loss restriction and a cautious exit strategy. The model of postmodern war can be seen in the 1999 NATO air war against the Milosevic regime, a calibrated war where high-tech allied forces were opposed to modern Serbian armed forces, primarily Serbian air defence.

Modern war takes place in a classical form known from military history, characterized by the confrontation of the armed forces of rival countries on land, in the air and at sea. The evolution of this model of warfare, retrospectively, can be traced back to 1285 BCE when

the Egyptians defeated the Hittites in a battle fought with war chariots (recorded in history for the first time) and infantry at Kadesh (Hahn, 1963). In Western perception, modern war is fought by high-tech, traditional forces. This approach is linked to the great all-out wars of the 20th century, the Korean and Vietnam Wars, and the Gulf Wars. Interstate wars between developing countries take place in a similar way; only the operational and military level of warring parties may differ.

During the evolution of war conflicts, the postmodern war created its own antithesis, which is called a *premodern war.* This form of war is more of a civil war-type conflict of social character and purpose, including the struggle of ethnic, religious, civilian groups, terrorists, separatists, insurgents, rebels, international interventions and stabilization operations. The military toolbox of the premodern warfare is mixed: on the one hand, the use of modern weapons and on the other hand a kind of "blood and iron" combat mode (see terrorist attacks claiming massive civilian casualties or ISIS's deterrent video executions), which is alien to Western civilization. Though fighters of the premodern war also use modern technology, modern media, effective organizational solutions, their thinking and behaviour are characterized by an antimodern approach, extreme religion, traditional tribal mentality, and the mix of elements of the old value system. *This form of warfare combines conventional or para-military activities with unconventional and asymmetric combat tactics.* Furthermore, it is also typical of this form of warfare to highlight for its purposes the cultural, religious identity policy and exploit the benefits of ethnic and religious conflicts. In the premodern world, the forces are usually recruited from nonstate actors, now, not only at national and regional level, but – as we have seen with ISIS – at regional and global levels. Premodern wars, in many respects, constitute a kind of *cultural rebellion* against Western liberal philosophy, their deliberate rejection of all the universal values represented by American and European societies. We have seen this argument from ISIS after the terrorist attacks in Paris. Premodern wars include nonstate and cross-border civil conflicts, ethnic cleansing, religious wars that take place in a *zone of chaos that runs from Afghanistan through the Middle East to Africa.* As a result, the counter-insurgency theory emerged in Western military thinking, which became an indispensable part of the preparation and development system of the Western armed forces.

Wars and military conflicts of the new type are already under the full publicity of the media. The most important feature of the development of military technology over the past one and a half decades is *the high degree of condensation of space and time*, which causes remote actions to exert local effects and vice versa. The international system that forms in the world of interdependence creates an interconnected world order in which regional and local military developments can become a potentially global phenomenon. Experts soon realized that any confusion and conflict in any part of the world could quickly be quickly broadcast anywhere by all-pervasive global communication media (CNN effect). The importance of the media has been learnt not only by the Western great powers, the emerging states *(Russia Today, Al Jazeera),* but by terrorist organizations (ISIS).

An important consequence of the development of information technology is *the change in the role of military geography,* which, of course, does not mean the end of military application of geography. From the point of view of operational planning, logistical and cartographic analysis, geography continues to play a decisive role in the art of war, just as geopolitics and geostrategies remain important in the art of state leadership. With all

this, the weight of strategic geography, as a primary rationality in national defence and the determination of national security behaviour, has decreased. Globalization moves security *from territoriality towards a close interconnection*, and states can less and less afford to look only at events in their own "backyard". Although there are still many examples of local wars and conflicts today (Ukraine is a classic example), the regional and global relations have also appeared in *internal security tasks*. This is particularly noticeable today in the fight against terrorism and in mass immigration. Information technology further loosens territorial boundaries, cyberspace has become fully global. *The need to supplement the old forms of linear warfare with new nonlinear forms of conflict* is recognized by experts in the east and the west alike. *National security today can no longer be defined by the concept of borders alone.* As political, economic, infrastructural, media and psychological dimensions of the relationships between societies exist; attacks against them can no longer be characterized by the occupation or retention of the territory. Chinese military experts reached similar conclusions. According to Qiao Liang and Wang Xiangsui, professors at the General Staff College of the PRC, we entered the era of unlimited warfare, in which "there is no difference" between what is the battlefield and what is not. Natural areas (land sea, air and cosmic) have all become an operational dimension, but social areas (military, political, economic, cultural and psychological) have also become operational areas. The cyberspace connecting the two big areas has also become a milestone for which the opponents do not spare any effort. "The new principles of war are using all means, including armed force or no armed force, military or non-military, and lethal or non-lethal means to compel the enemy to accept one's interest." Warfare can be a clash between professional military forces or between the professional forces and the new forces formed by ordinary people and specialists. This is the watershed between unlimited warfare and the traditional, which is the starting point for new types of warfare (Qiao–Wang, 1999: 7.).

New war theories

The diverse world of wars, their broad spectrum, common and different characteristics is reflected in the development of security theory and the art of war. Following the end of the bipolar world, *new theories of war* emerged, capturing different facets of different authors, capturing a characteristic feature of the military conflicts ever increasing in number and changing in content. A brief introduction to the authors and works of mainstream literature aims to provide an outline of the theoretical development related to warfare.

American political scientist John Mueller was the first to break with Cold War thinking in 1991, developing the theory of the obsolescence of the Great Wars (Mueller, 1991). Based on the analysis of the events of the bipolar world, he believed that in advanced democracies war was as obsolete as slavery and duelling. The view that democracies do not wage war against democracies later became one of the crucial presumptions of security policy of liberalism. Later on, on the basis of the experiences of the first Gulf War, Israeli historian Martin van Creveld argued that the age of wars between states characterized by Carl von Clausewitz at the beginning of the 19th century was over. According to his assessment, the Clausewitzian theory of war is no longer valid in the new era, and the theory of Western classical warfare has become obsolete. In his book entitled *Transformation of War,*

he argued that small military conflicts put an end to conventional war, and a new model of warfare, a new pattern of *low intensity conflicts* is taking shape. The new wars are fought by guerrillas, terrorists, religious and secular forces, and various gangs wishing to achieve their most diverse political goals by the simultaneous use of the primitive and the most modern weapons (Van Creveld, 1991).

In 1993, American futurist Alvin Toffler enriched the literature with the concept of high-tech information warfare. The central metaphor of his book is an image of the waves of change clashing one another, which shows how the formations of successive periods, economic, social, political and cultural qualities are piling up, one on top of the other (Toffler, 2004). The so-called *"third wave theory"* has launched a debate on the new revolution in military affairs (*RMA*), still going on today. Toffler and the theoreticians of information warfare considered the first Gulf War to be a postmodern war fought on a high-tech basis (Haig–Várhegyi, 2005). In their view, the new equipment and methods used in the war (precision strikes, dominant battlefield knowledge, stealth equipment and technologies, GPS system, superfast weapons) will shape the conflicts of the future for a long time. RMA ideas are still decisive in long-term military planning, especially in countries with advanced military research, development and innovation. The United States stands at the forefront of developments defining future warfare (Szenes, 2015).

Contrary to the technological approach, from the mid-1990s several American technical writers have drawn a vision of a war in which the social organization of the countries at war was far more important than the level of technology used. *Robert Kaplan,* an American *journalist and security analyst,* describes the future war, for instance, as an *impending anarchy* of the Hobbesian world of *failed states*. Based on the analysis of the West African states, he came to the conclusion that the new world brings about the erosion of nation states, while developing countries slip back to the past due to illness, overpopulation, crime, exhaustion of resources, shortage of water and environmental pollution. This chaotic vision is further worsened by the clashes between civilizations, the colonial heritage, the general lack of security (Kaplan, 1994). American professor Philip Cerny says conflicts of the future are the result of the "new medieval" emergence of warlords and violent disintegrations. Globalization challenges and the new security dilemma will lead to the weakening of state functions, there will be more quasi- governments, cultural identity, social, economic and political spaces will need to be reconfigured. By doing so, chaos may perhaps be avoided, but the result is becoming more and more the "lasting mess of the Middle Ages" (Cerny, 1998). In his famous book, Samuel Huntington predicts the *clash of civilizations* emerging as a result of changes in the balance of power between different cultures and of new world order based on civilizations. Potential armed clashes are expected mainly along the borders of Islam, between the regional dominant states and along the default lines of conflict (Palestine, Ukraine, Ethiopia). In these confrontations, the role of religion and cultural identity is greater than in traditional wars, and they are characterized by prolonged, unpredictable and bloody combat activities (Huntington, 1998). According to Ralph Peters, a US military expert, a "new warrior class" is emerging in the modern war and the new adversaries (warlords, terrorists, rebels, international criminals, beneficiaries of conflicts, rogue armed forces) do not respect the historical rules of warfare. The new enemy fights both in the cities and in the information jungle, shouting "Allah Akbar!" and calling for revenge, and is driven by hatred and violence, and fights to the death. The new warfare will

be no more than the conflict between the Western forces accompanied by the media, with various military cultures and paramilitary forces from Mogadishu to Grozny. The popular bestseller writer's conclusion is pessimistic; he believes the US forces cannot adequately prepare for the changes in the 21st century warfare (Peters, 1999).

By the late nineties and at the turn of the millennium, more and more articles and papers were published on *the war conflicts of the future, of the 21st century.* War has become a sought-after thing in the "cookbook" of the theories, be it about specific war descriptions or evaluation-analytical studies or books. Works on *asymmetric warfare and conditions of modern warfare* came to the forefront. US Secretary of State Madeleine Albright warned in 1998 of the danger of terrorism, a change in the character of the war, which in the future would be fought by rogue states and nonstate entities under the threat of the possible use of weapons of mass destruction. General Mahmoud Gareyev, president of the Russian Academy of Military Sciences, says the 21st century war becomes *"multi-variational"*, with the armed forces needing to develop their multifunctional relationship to modern conflicts and local wars. The transformation of the forces should be carried out according to the changes in the international environment and the demands of the revolution in military affairs (Gareev, 1998). In 1999, Mary Kaldor, a UK professor, was discussing the new war which is based on the primacy of politics and the privatization of violence challenging the new world order. The new armed conflicts differ from conventional warfare in that they are fought by state and non-state actors and networks alike; they are not ideological but identity wars; the conflict is primarily about political rather than physical goals to be achieved through fear and terror; and their funding often involves "predator methods", making belligerents interested in pursuing political violence. Kaldor maintains her position after 15 years and emphasizes that new wars have been described as new concepts ("war between people", "third type wars", "hybrid wars", "privatized wars", and "postmodern wars"), but in substance they all use similar arguments. Modern wars are hard to describe in terms of peace and war, political or criminal violence (Kaldor, 2013).

After the turn of the millennium, following the attacks on the United States on 11 September 2001, *terrorism got into the focus of military security.* Professor Herfried Münkler, a German political scientist, similarly to Kaldor, has clearly considered the attacks to be acts of war and not a crime. Fighting terrorism is a completely new form of war, a low-intensity armed struggle against an enemy that has no body, with war becoming a form of life for terrorism, ambushing the civilian population and using it as a shield. The strategy of terrorism is directed against Western symbols and Western societies in fragile state of mind, and strives for its success with violence, arousing fear and terror. It flouts international law, breaks the rules and conventions of warfare; it operates covertly, insidiously and cruelly. In this way, terrorism has created a new form of the combination of violence, creativity and rationality, which gives the war a new shape. According to Münkler, the successful combating of thr "re-barbarianization" of the war requires broad international efforts, involving new types of "pinpoint precision style" military actions capable to destroy the terrorists' logistics system. Terrorist organizations also need territorial bases of withdrawal, just as "creeping plants need their rooting sites", so without having their resources dried up or exhausted there is little chance of success (Münkler, 2001).

The global war on terrorism, the war fought by the United States in Afghanistan and Iraq, highlighted the study of theoretical and practical issues of non-conventional and

asymmetric warfare, assessing its impact on future wars. In Anglo-Saxon military theory, more and more people have recognized that in the multiplicity of threats the *conventional and unconventional conflicts* are increasingly mixed, the international legal and moral constraints defining warfare become blurred. *Huba Wass de Czege* and *Richard Hart Sinnreich*, US military experts, say that conventional and unconventional forms of warfare *are continually merging.* Any major military conflict in the future will most likely bear the common, interwoven features of these operations. Similarly, the demarcation line between the front and the rear (hinterland), between the battlefield and the strategic operations begins to vanish as the actors of the war become increasingly independent through the use of communication equipment and space-based systems. Due to changes in the world, general purpose forces, operational manoeuvres to be executed over strategic distances, multidimensional operations and adaptive superiority of forces will acquire particular importance (Wass De Czege-Sinnreich, 2002).

Military trends in *multidimensional operations* are increasingly referring to the *counter-war theory* or operational strategy of *the mastery of violence* "developed" by European military thinkers. In France, for example, counter-war theory says that *war in the 21st century has become a complex blend of phenomena*. According to French military theory, in today's military conflicts it has become increasingly difficult to "treat" war as the clash of rival armed forces. The difficulty of delimiting conventional and unconventional warfare forms, methods and solutions has brought about the *blurring of the line of authority* between political and military responsibility. Nowadays, soldiers frequently have to undertake intervention operations under conditions that are not in line with classical warfare or conventional peace-support operations. Therefore, counter-war theory, which is based on the principle of *conscious and disciplined control of violence,* can be applied in special, extremely complicated political circumstances, where organized state operation is absent and the institutional system of law and order is not functioning; nevertheless, the legal regulations of international law and the laws of war must be observed. French military experts Loup Francart and Jean-Jacques Patry think that military operations today are fully integrated in political, diplomatic, economic and cultural activities. Strategy is no longer merely a military-defence issue. Today's problem, compared with the past, is, rather, how we can plan military operations within the given policy framework. "A suitable strategy must be based upon a clear assessment of the different types of violence that can be met in the field" (Francart–Patry, 2000: 146.)

General Wesley K. Clark, former SACEUR (Supreme Allied Commander, Europe) of NATO, in his book entitled *Waging Modern War*, has a similar view; he explains that in modern circumstances, politics not only defines the strategy, but *completely pervades all levels of the art of war,* strategy, operations and tactics. In the past, policy was essentially a strategic tool by which state leadership directed the military and the use of military assets. In the 21st century, however, politics enters into professional military affairs to such that, according to Clark, it is now necessary to think about what the political level of war in such circumstances really is (Clark, 2001). If the US General were right about this issue, civil-military cooperation (CIMIC) would have to be placed on a completely new footing in the future.

The versatile approach to research, discourse and results finally created the theory of *fourth generation warfare (4GW)*,[5] which has become a widely recognized, dominant concept in a decade and a half. The authors of the theory, *William S. Lind* and *Thomas X. Hammes* were US military experts who expressed their views in a number of studies. The initiator of the change of concept, the historian Lind had, along with his colleagues, outlined the theoretical framework of the fourth-generation warfare as early as in 1989 (Lind et al., 1989). In their opening argument, they argued convincingly that third-generation warfare, which had been dominant for seventy years, would be transformed by post-Cold War events. According to the findings of the research group, 4GW will no longer be based on Western traditions, but Islamic or Asian type of combat activity will be its central element. The driving force behind fourth-generation development will be information technology and ideology (religion) that will combine conventional types of warfare with terrorism. The new warfare will run on a transnational basis (ideology, religion), involving a direct attack on the enemy's culture, and physical operations will be coupled with extremely complex forms of psychological warfare in which the media are involved. Based on the experiences of the wars in Iraq and Afghanistan, under the term "fourth generation war" Hammes understands armed uprisings, which are difficult to cope with for modern armies by waging a third-generation war. The adversaries will do their utmost to convince the enemy leadership that their strategic goals are unattainable or too costly compared to the results obtained. To reach their political objectives they will use the "gaps" in the connections of the international system, the conflicts of different nation states, networks above and below states. With their combat activities they send different messages to different target audiences. As for their tactical toolbox, they will deploy all available weapons, information technology and new battlegrounds (e.g. suicide bombers, improvised explosive devices, chemical and pathogenic substances). Since they do not want to win battles but war, the duration of fourth-generation warfare is much longer than that of previous wars and campaigns (Hammes, 2005).

Debates about war in the future and the nature of warfare, pursuant to the mission-related deployment of the Hungarian Defence Forces in Iraq and Afghanistan, were also published in Hungarian military journals. These publications did not confine to discussing the most well-known Western theories, but they also adapted them to the better preparedness of the Hungarian armed forces (Deák, 2005, 2013; Hajma, 2005; Szenes, 2005; Kőszegvári, 2009; Takács, 2016). A reference book was dedicated to asymmetric warfare, in which researchers not only elaborate the theory and procedures of fourth-generation warfare, but through various case studies (Budapest 1956, Punjab 1980–1994, Grozny 1995,

[5] The term "generation" used in military strategy and the art of war captures the way in which the features, dynamics and direction of development of a given war period can be described.
Military science linked the evolution of warfare to different historical periods and phases. In the *first generation* of modern wars (1648-1865), mass armies became dominant, whose development reached their peak in the Napoleonic wars. The *second generation* was defined by firepower and peaked in World War I. The *third generation* (1918-1991) was characterized by mechanized warfare which was combined with the possible use of nuclear weapons from the 1950s. The *fourth generation* (1991-) created forms of warfare that were t*he result of political*, economic and social *changes* that have taken place since the Cold War. *While Western literature is relatively uniform in defining the phases of the generations (although the need for* identifying *the fifth generation has appeared in several articles*), Russian military science is already talking about a *sixth generation* warfare that began in 2014.

Nablus [Palestine] 2002, Fallujah 2004, Basra 2003, 2007; Tal Afar [Iraq] 2006) they also demonstrate the diversity of uprisings (Resperger et al., 2013).

Following the Russian aggression against the Ukraine, the *concept of hybrid war* emerged, generating substantial debates in politics and in the reference literature, but since NATO has adopted the concept, and its use is increasingly widespread. The creation of the concept of hybrid war is associated with William J. Nemeth, a US military expert who has come to this conceptual conclusion after the Chechen wars had been analyzed (Nemeth, 2002). The leading theoretician of hybrid war is the researcher of the National Defence University of Washington, Frank G. Hoffman, who dedicated a monograph to the conceptual description of hybrid wars (Hoffman, 2007). According to Hoffmann, in the 21st century hybrid wars, i.e. the use of irregular (state) and irregular (non-state) forces and their combat techniques, merge with one another and are combined with terrorist acts and crimes against the civilian population living in the area of operation. It is an important feature of this complex warfare that all activities are coordinated to achieve the greatest physical and psychological impact for the stated political goals. Hoffman's concept of hybrid war, published in 2007, was subject to debate and was not accepted, let alone "translated" into military doctrines or regulations. However, the Russian aggression against the Ukraine in 2014 threw a different light on Hoffmann's concept. An article on non-linear warfare was published by Army General Valeri Gerasimov (Gerasimov, 2013). It was only after the Ukrainian military conflict that the world came to marvel at the article written by the Russian Chief of Staff, when it turned out that the annexation of the Crimea, the support granted to separatists in East-Ukraine, and the big politics of Moscow all followed the scenario described by the general (Berzins, 2014). Based on the events of the Arab Spring, the Russians thought that even in a prosperous state an armed conflict may develop in months or even in days, which could destabilize the country or lead it into a civil war and may cause a humanitarian catastrophe. Hoffman's concept has been extended to all dimensions of the country and society, politics, economics, commerce, communication, cyberspace, human relations, and the use of military forces. The role of non-civilian elements of power in achieving political and strategic goals has increased, the effectiveness of which often exceeds the firepower of the weapons. Civilian and military assets are being deployed in accordance with the protest potential of the population, supported by information and special operations carried out covertly. The open use of military forces takes place only at a specific stage, primarily in order to achieve success, and even then, only as peace-keeping, crisis-management forces granting support for humanitarian aid. The essence of the hybrid war, as Gerasimov wrote, is that the war is everywhere. There have been excellent papers written on theories of hybrid in Hungary (Rácz, 2014; Kajári, 2015). Many experts dispute the generality of the "Ukrainian case", although several civil wars in the MENA region (Syria, Libya and Mali) assumed a hybrid quality.

We end this overview of the new war theories, to give, as it were, a counter-point to what is written above, with the book entitled *Future Warfare* written by the British-American strategist Colin Gray. This book shows in a grand historical analysis that the nature of war has always been constant, *only its character* has changed, depending on time, technology, fighting opponents or motives of combat. The author has no confidence in the predictable future but believes in a tenet of history when he claims that our future lies in our past (Gray, 2005).

Based on the review of literature we can see that in the wars of the 21st century the cooperation between politics, the force and the civil power components is increasing. It is not certain that in all instances in the future the purpose of the use of forces will be the destruction or crushing of the enemy, rather the impact-based subdual of resistance or the freezing of the conflict by using force that is proportional to the aggression. *Forces in the future will be used more as a fencing foil rather than a claymore.* The requirement for the use of military force in a surgical way requires future military thinking and activity that is politically sophisticated, professionally correct and flexible, legally correct, and morally exemplary.

Asymmetric warfare and the hybrid war

From the military challenges of future war, a *diverse warfare scenario* can be constructed. It is likely that the modern war will remain the same "chameleon" (Clausewitz) as in the past; it always adapts to strategic circumstances and appears in inter-state, sub-state and cross-border warfare modes or in a combination of these. Perhaps it would be a mistake to say that in the future the war between states can be completely excluded. In some parts of the world (like the EU region in Europe, America, Australia), this is likely to be done with great certainty. But in other continents (Asia, the Middle East, Africa) the traditional war between states remains a real possibility. It can be said, however, that the coalescing modes of armed conflict bring a *new era of warfare*, in which old and new war actors can enter into alliance or confront each other. In the new war era, conventional and unconventional, symmetrical and asymmetric operations can be concurrently and simultaneously interwoven into a hybrid war in space and time. The hybrid clash will have a different role in the armed forces than in conventional warfare, military capabilities must be applied to the "master plan" of the war together with civilian means of power. Military conflicts will continue to be characterized by regular and irregular forces, which, however, work in coordinated action in different battlefields and organizational forms, and, in some cases, irregular forces will be of the utmost importance. In compound warfare, the various state sponsors, supporters and the "bandit solutions" providing logistic support for asymmetric warfare will have a key role.

The future (fifth) warfare generation will have a *networked joint* character. The evolution of information technology has brought tremendous changes to communication and command systems, created precision weapons, stealth technology, and "squeezed" the temporal and spatial parameters of combat activities. Technological progress in terms of width, depth and altitude has created a *non-linear battlefield*. The emergence of the *battleground concept* has also brought about a significant change in Western warfare techniques during the 1990s as it replaced the mass concept based on linear tactics with the idea of *simultaneous, five-dimensional* (land, sea, air, cosmic, information), *often no-contact, concentrated attacks*. The idea of impact-based warfare is especially effective when all strikes are delivered simultaneously in all dimensions. Less advanced forces will continue to use fourth generation warfare solutions.

The possibility of *simultaneous strikes* is provided by the computer-satellite information system, which allows strike groups to obtain a *more and more accurate picture* of

the operational situation. In the advanced armed forces and at alliance (coalition) levels there will be *full network* connectivity between sensors, decision makers and the combat equipment delivering the strike because the reconnaissance and detection devices will be electronically connected with the strike forces. Due to the capabilities of delivering multidimensional strikes, *smaller forces* are expected to be deployed on land compared to today's processes. A soldier will have much greater impact on the events than now, because the precision, reconnaissance capabilities of his weapons, the communication system will be improved. That is why the individual soldier is called the *"strategic corporal"* in Western technical language (Krulak, 1999). The achievement of greater impact is also ensured, as we have seen in Afghanistan and Iraq, by the fact that land forces also act as a kind of combat sensor for the air force, and they help to achieve a more accurate strike.

The dominance of reconnaissance and of the delivery of strikes makes it possible for modern armies to plan joint operations as a series of wide-area ambushes. The new technology provides wide-ranging application of high-precision strikes and rapid manoeuvres across the entire operational area. As the enemy can be easily identified by instrumental detection and stealth technology, instead of closing with the enemy directly, destruction of the enemy can be accomplished by accurate, well-placed strikes, with *ambush* techniques and effective positioning of friendly forces. High-precision weapons, however, can only be used effectively in long-range, great depth air-land warfare. At low tactical depths, in close combat, the infantry and the special forces retain the lead role in the direct destruction of the enemy. In urban combat, the role of armoured forces and artillery is likely to remain, as otherwise it is not possible to provide effective fire support to the advancing infantry. Experiences in Afghanistan, Iraq and Syria show that high-precision weapons alone cannot destroy the enemy in stubborn defence, because although they are very good at point targets, they are less effective in frontal attacks on wide areas. On rough, high-mountain terrain, even conventional striking combat equipment cannot be used with maximum efficiency. The use of joint strike groups made up of infantry, armoured, artillery and air force components continue to have a key role because the air force in itself is not sufficient to win the war. The experiences of recent wars also confirm the old tenet of the art of war that not even the most advanced warfare can do without the modern use of land combat forces.

The impact of new threats on preparing for the forces

Numerous conclusions can be drawn from the analysis of the rich and sometimes controversial literature dealing with the wars of the future. We must accept that in the war conflicts of the 21st century we encounter a wide range of *old, new and hybrid forms of warfare.* During the Cold War, the Western world faced the "one-dimensional" Soviet threat that was more or less predictable. In the new century *there are no such predictable circumstances* and we must be prepared for the unknown, the uncertain, the unseen threats. Therefore, security theory and military research should pay more attention to the study of the *full spectrum of conflicts*, to explore new forms of warfare between states, sub-state and cross-border, to identify the transit paths, overlaps and interconnections between them. The exploratory work has to be done by studying the conduct of *multinational military operations and hybrid warfare* in complex conditions. For military technical solutions, the novel tasks related to

proportionality, coercion, dissuasion and support must be combined with the "conservative" tasks of conventional battlefield operations. In particular, it is necessary to prepare for the simultaneous, complex management of *symmetrical, asymmetric and hybrid threats*. Full-spectrum conflict management in the Western world is not entirely new, since the theoretical category of conventional (high intensity) and non-conventional (low-intensity) conflicts has long been used. As for hybrid warfare, the West first saw it in relation to the Ukrainian crisis and the southern threats, but preparation has already begun. It seems certain that adaptation will not be easy since the multidimensional and asymmetric nature of multidimensional and asymmetric nature of the hybrid threats and military conflicts, their intertwined features and the multiplicity of actors require other types of security and defence policy than dealing with the earlier, more predictable forms of war.

In the 21st century, managing complex security problems is no longer possible at the national level, with a single-scenario strategy, with forces with a rigid structure. Traditional threat concepts and defence must be complemented by new military doctrines of the *pre-emptive strike, counter-measures (prevention) and expeditionary warfare*. In addition, the armed forces must be prepared to carry out internal security tasks, to support the police forces and to carry out border protection tasks. States need to have armed forces with *a wide range of capabilities* to meet the challenges of the full spectrum of external and internal conflicts. Readiness should include *preventive deployment, pre-emptive strikes, defence tasks, counter-terrorism operations, military police and disaster relief tasks, traditional peacekeeping, peace building, or a combination of these.* Only versatile training provides the strength of the forces in high and low intensity operations (high-low mix), against any enemy, under any circumstances and during any task. According to historical military experience, a highly trained soldier can be assigned to carry out a simpler task (train down), but no personnel trained for low-intensity operations (train up) can ever accomplish a serious combat mission. What is more, all activities at home and abroad require combat readiness, combat support and combat service support capabilities that can only be obtained from military organizations prepared for conventional warfare.

The merger of the modes of armed conflicts brought along not only the fourth-generation warfare but started preparing for a new era of warfare. In the wars of the future, in addition to conventional modes of armed clashes, forces and equipment, hybrid organizational formations emerge, the specialized, specops (special operations) units, counter-terrorist forces, private armies, international organizations and non-governmental actors. Terrorist attacks can be transformed into classic guerrilla warfare and later escalate into a traditional war conflict. Continuous and sporadic armed conflicts are "blurred" in space and time, symmetrical, asymmetric and hybrid combat modes will be present in all (land, air, sea, space, and cyber) combat dimensions. It follows from all this that armed forces must be *multifunctional* in order to have the capability of averting the threats and adapting to the various modes of fighting wars in the entire conflict spectrum. These requirements will be met by the European Union's new global strategy for foreign and security policy, the adaptation measures of the NATO Summits (Wales 2014, Warsaw 2016, Brussels 2018) and the renewal of national defence concepts.

Preparing for hybrid threats has brought about the restoration and reinforcement of the power of resistance (resilience) that has already been forgotten after the Cold War, which

must be created not only at armed forces and bodies, but at state, social, economic and infrastructure levels alike.

In order to meet the requirements of the future, networked joint forces with new generation weapons are necessary, which can be deployed in multi-dimensional, multinational, expeditionary, and defence-type operations. Power-projection and mobility are important because it is only in this way that it is possible to achieve dominance in certain operational areas, to counteract the *high-low* prevalent there, to meet the requirements of a wide range of different conflicts. The organizational size of the military forces involved in modern operations is steadily declining, with organizational structures of division and battalion level (or joint forces with equal strength) coming into the forefront, and the task-tailored *Task Force* type units and formations of varying strengths. The force structures of the future must become more and more *modular* in order to be able to create, at short notice, rapid response groups of forces that are adequate to the given mission. Modern military development aims to create *a wide range of military capabilities,* from which always that particular capability *can be retrieved,* which is necessary for the situation and the accomplishment of the mission. In both domestic defence tasks and expeditionary warfare, one of the most difficult tasks is to coordinate *versatility of deployment and organizational stability.* Modern forces, on their own, in alliances or in an ad hoc coalition, should be able to carry out complex, multi-dimensional tasks where the operational environment ranges from air-land, sea-land operations to total, conventional land warfare. Beside classic warfare missions, there emerges the need for the ability of the country to participate in the internal security tasks of the alliance, the need for suitability for the military constabulary, the special disaster relief and humanitarian aid tasks. An increased demand for *flexibility of deployment* will in the future reinforce (make it more frequent) the need for organizational change, the importance of technical modernization, the modification of preparation, training and education, and the creation of a multifaceted set of conditions. The creation of smaller combat formations (such as joint brigades, hybrid regiments, etc.) serves as a modular building block for the build-up of forces, which must co-operate with police forces, civilian authorities, social organizations and international institutions.

Conclusions

In the early 21st century, the world has entered an era in which the role of military security is constantly changing; the war between the classical states has been complemented with the non-state actors' threats, conflicts and combat modes without boundaries. Sub-state and cross-border "belligerent parties" can use the new technical achievements of our time just as "traditional" actors of warfare. Non-state actors (terrorists) can deliver unavertable strikes on any country or society.

Following the Ukrainian crisis in 2014, collective defence and deterrence duties have again been highlighted, the danger of military intervention by another state cropped up again. The states of the transatlantic area must now be prepared for the hybrid threats, not only to deal with possible external military attacks, but to deal with the multitude of threats (prevention of the proliferation of weapons of mass destruction, cyber defence, managing mass migration, combatting piracy in international waters, energy security tasks, etc.) and

to increase the resilience of countries and alliances. National security increasingly depends on the *internal protection* of the institutional systems of the countries. The nation-state model of the war based on threat analysis by the traditional enemy must be complemented by strategic methods of *reducing vulnerability* to non-state threats. The wars of the future will stem not so much from the ambitions of the states, but rather from their weaknesses.

For purposes of addressing the military challenges of the future, modern states need *well-equipped, highly mobile and versatile armed forces*. Armies that on the one hand are capable of efficiently taking part in multidimensional, multinational, high and low intensity operations both at home and abroad, and on the other hand, they are capable of controlling the violence in the full spectrum of conflicts. These capabilities should be built by every state individually, but in the case of membership in an alliance the capabilities should be developed as part of the alliance, coalition. This does not mean copying and following some of the major powers, a servile policy of *bandwagoning* but also the use of military *know-how* of international security organizations (UN, EU, NATO, OSCE), the rational adaptation of alliance concepts (such as *Smart Defence* or *Pooling & Sharing*). The military force *is increasingly intertwined* with politics and becomes a means to shape, maintain, punish, pass, protect and influence the strategic environment of conflicts. It is therefore very important that the military be included in a broader (comprehensive) security strategy, which is intended to protect both the national and community interests and values. For the efficient implementation of this strategy, high-level international cooperation in intelligence and diplomacy, strong and purposeful national and international security and defence policy are needed.

Security theories and the art of war must synthesize the enormous amount of literature on military security, hybrid threats, future wars, conflicts and warfare. The conclusions must be compared with the changing world of newer and newer, conventional and non-conventional hybrid threats, and forward-looking proposals have to be developed. Only those approaches can bear fruit that cannot only demonstrate the increasing complexity of military conflicts, but also strive to capture the holistic and multidimensional character, sociological and technological dynamism of the phenomena. Conceptual development can only come from research that studies the relationship between war and society and the world, assesses the convergence of conflicts, monitors the requirement of the control over the forces in the world of global media broadcasts and, in the case of multi-purpose forces, keeps in mind the development issues of applying the whole spectrum of conflict. An important goal of studying military security topics is to include the results of international research not only in professional thinking and education, but to use them to meet the challenges facing the national defence, the theoretical support of the deployment and development of the Hungarian Defence Forces. *In this work, the Hungarian civil science disciplines also have their tasks, only multidisciplinary (civil and military) research helps to understand the complex problems of new wars.* We should listen to Thucydides' teaching: "The society that separates its scholars from its warriors will have its thinking done by cowards and its fighting by fools".

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Islam and Islamism as Security Challenges

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Abstract

By the second decade of the 21st century, Islam itself – and Muslims who represent Islam, especially Muslim migrants – and not only radical Islamism or jihadism have gradually become a reason for securitization. Threat is mainly perceived in two fields: terrorism and social security.

According to Sayyid Qutb's "permanent jihad" theory, jihadism considers jihad, reinterpreted as a constant fight against foes, to be the duty of each individual. Since jihadism became globalized and transnational jihadist organizations were established, terrorist attacks motivated by jihadism (or related to jihadism in any other way) have also become globalized, and from the earlier, predominantly local levels they have risen to an international level spanning to the United States and Western Europe.

The primary target of al-Qaeda has always been the West, whereas the Islamic State turned against the West after having encountered difficulties in "building" a state while losing ground in Iraq and Syria; since then, is attacks have targeted Europe. The stock of second- and third-generation Muslim immigrants who failed to integrate into the European societies which accepted them have become an increasingly important source of jihadist terrorism. Many view the spread of Islamic culture in Europe along with the ever greater numbers of Muslim immigrants to be increasingly threatening the essential features of European societies, European values, and collective national identity/identities.

For reaching a long-term solution, the causes need to be addressed. Taking steps to solve the crisis in the Middle East is an essential condition. A situation has to be created which puts an end to armed conflicts and which enables the millions of refugees to return to their homelands. In Europe, too, complex measures have to be taken. Besides the must to solve the refugee crisis, promoting the integration of migrants is also an urgent task. The dividing line between Islam and the West is only secondary to the one between radical jihadists, who use terror as an instrument, and the moderate "rest". In the fight against jihadism, Christians and the moderate Muslim majority are allies. One of the main problems is mutual mistrust, which should be countered by building trust from both ways.

Keywords: securitization, jihadism, threat, apostasy, integration, Islamism, Islamic State, Al-Qaeda, refugees, migrants, societal security, terrorism

Introduction

By the first decades of the 21st century, Islam and Islamism (and its radical wing, jihadism) began to play an increasingly important role in terms of security, presenting a serious challenge – especially in two dimensions of security –, which is interpreted and experienced by politicians, experts, and a part of the society as an actual threat that affects everyday life. The two affected dimensions are *terrorism* (terror threat) and *societal security* (threat against the Western civilization, which is rooted in Christianity, and the collective European identity [identities]).

By 2016 the situation became particularly serious because in 2015 a migration crisis the likes of which had never been seen before broke out – and the European Union failed to find the right formula to respond to it –, and in Europe there was a rash of terror attacks that were linked to jihadism in some way.[1] Actors advocating the necessity of *securitization*[2] emphasized the intensification of the dual threat posed by hundreds of thousands of migrants: first, the threat to the European identity and culture, and second, the threat of terror that increases in parallel with the rise in the number of migrants.

The above threats have a deep impact on Europe, the European security situation, and the perception of security. As far as the actual threat of terror is concerned, however, the target area of terrorism – specifically, jihadist terrorism – is much broader: most of the jihadist terror attacks are launched outside Europe in the broader Middle-Eastern region.

Increasing securitization of the Islamic (Islamist/jihadist) threat

The nineties: the "Islamic threat"

The coming of the last decade of the 20th century and the dawn of a new, post-bipolar international system brought for the West a new concept of the enemy: the threat posed by the Soviet Union and the communist block was replaced by the "Islamic threat"[3], at least in the communication of certain political leaders, experts and media. In 1995, the then-Secretary General of NATO, Willy Claes, declared that since the end of the Cold War, "Islamic militancy has emerged as perhaps the single gravest threat to the NATO alliance and to Western security." (Pipes, 2002: 22.). Dan Quayle, vice president to George W. Bush, Sr., compared the threat of radical Islamic fundamentalism to Nazism and communism (Esposito, 1995: 189.). Certain leading Western media outlets even talked about "the start of a new cold war".

Among experts, similar thoughts were expressed. One of the most influential orientalists, Bernard Lewis, who was an advisor on the Middle-East to US President George W. Bush, Jr., used the phrase "clash of civilizations" for the first time in his study dissecting

[1] In July 2016 there were four such incidents within a week in Germany.

[2] This study is not meant to provide an in-depth introduction to the concept of *securitization* developed by the Copenhagen School and, first and foremost, by Barry Buzan and Ole Weaver (see, in particular: Buzan et al., 1998; see more about the subject in Hungarian: Marton et al., 2015; 19–46.).

[3] The situation is not so clear-cut as "radical Islam", "Islamic fundamentalism", "Islamic militancy", and other categories that were in some way related to Islam, but could not be applied (at least, not necessarily) to the entirety of Islam were also included as the source of threat.

"the roots of Muslim rage" published in September 1990 (Lewis, 1990), presenting a vision of 1400 years of confrontation between Islam and Christianity[4]. The greatest impact was produced by the "civilizational paradigm" of Samuel Huntington, an American professor of political sciences, which posited that the post-cold war international system should be analyzed using a new "civilization" based approach (Huntington, 1996). According to this paradigm, the new lines of conflict in the international system now lie between civilizations, of which the most dominant one is the *"West versus the Rest"*, and in particular, between the Western and the Islamic civilization.

Indeed, the nineties were plagued by various attacks launched by various organizations and persons who originated from Islamic civilization (and were mostly associated with the al-Qaeda network)[5], culminating in the events of 11 September 2001. All these incidents prompted Huntington to call the period spanning the first years of the 21st century as "the age of Muslim wars" (Huntington, 2001[6]) and to reassert his previous claim that Islam had "bloody borders". Huntington seems to have been vindicated – and is still being vindicated – by the terror attacks that have been cropping up ever since[7], the activation of radical Islamism (jihadism), and the emergence and conquest of the Islamic State. The word *Islam* acquired an increasingly negative connotation: people began to regard it as something which threatens the West (Europe), inherently entails (because, one might say, it can be traced back to the Quran) radicalism and violence, and which is alien to Europe and to the Western civilization and its values.

The 2000s: increased perception of threat

By the end of the 20th century and the beginning of the 21st century, the transnational, internationalized and globalized Islamic radicalism (jihadism) clearly became a subject of securitization. The "War on Terror" announced by US President George W. Bush focused on jihadist terrorism in the first place. Since jihadism became globalized and transnational jihadist organizations – first and foremost al-Qaeda and later the Islamic State – were established, terrorist attacks motivated by jihadism (or related to jihadism in any other way) have also shifted from the earlier, predominantly local levels to a global international level spanning the United States and Western Europe.

As for *societal security*, many people consider the spreading of Islamic culture in Europe – brought about by the rising number of Muslim immigrants – as an increasing threat to the defining features of European societies, the European values and the collective national identities embodying Europe and Europeanism, and steps are taken to securitize the

[4] Instead of *Christianity,* Lewis uses the term *Christendom*, referring to the Christian civilization/culture and not to the Christianity as a religion.

[5] December 1992, Aden; November 1995, Riyadh; June 1996, Dhahran, Khobar towers; August 1998, US Embassy, Nairobi; August 1998, US Embassy, Dar es-Salaam, etc.

[6] "Muslim wars have replaced the cold war as the principal form of international conflict. These wars include wars of terrorism, guerrilla wars, civil wars and interstate conflicts. These instances of Muslim violence could congeal into one major clash of civilizations between Islam and the West or between Islam and the Rest."

[7] October 2002, Bali; May 2003, Riyadh; March 2004, Madrid; July 2005, London; 2008, Mumbai; January 2015, Paris (against the offices of *Charlie Hebdo*); November Paris (the Bataclan Theatre, the Stade de France stadium); March 2016, Brussels; July 2016, Nice.

defence of European civilization and culture. In literature on security it has been a widely recognized fact, which is quoted frequently these days in the context of terrorism, that the objective (real threat) and subjective (perception of threat) approach to security are often markedly different (Gazdag–Tálas, 2008: 9; Nagy, 2016; Szabó, 2016),[8] and a significant portion of the citizens and the public perceives a threat greater than in reality. Subjective perception of security changes owing to various factors. As Péter Tálas very aptly noted, "judgment about the threat posed by a certain security policy related challenge [...] depends on how realistic and differentiated our approach to and our evaluation of the given issue after the first shock of experiencing the challenge, and to what extent we are able to get rid ourselves of the shackles of our political views and prejudices" (Tálas, 2009: 32.).

Shaping of the subjective perception of security and the process of securitizing the individual threats are dominated by politics and the media. This is due to the fact that a key element of securitization is speech, i.e. making an effort to focus the attention of the public on the threat that is to be securitized, using communication targeting as wide a group of the populace as possible. The above statements are particularly applicable to Islam or rather the security challenges that are in some way related to Islam. There are a lot of prejudices regarding Islam in the first place, from superficial knowledge to generalizing conclusions. Surveys have showed that the word Islam has mostly negative connotations in the programs of the Western-European media (violence, terrorism, disadvantaged status of women, etc.), amplifying the "alien" character of Islam as a religion and culture in relation to Europe. Furthermore, even the experts subscribe to contrasting views in regard to various subjects related to Islam.

As far as the actual threat to the West and to Europe is concerned, on the one hand, there are very conflicting opinions about what can be identified exactly as the origin of the threat/risk: Islam itself or Islamism or maybe its radical wing, jihadism. On the other hand, the views also differ regarding the question of how serious and how great the actual threat is. Huntington already posited the following opinion well over two decades ago, which is still shared by many people today: "The underlying problem for the West is not Islamic fundamentalism. It is Islam, a different civilization whose people are convinced of the superiority of their culture and are obsessed with the inferiority of their power." (Huntington, 1996: 217.).

By 2016 the generalizing conclusion that in the past decades – specifically in 2015 and 2016 – the perpetrators of the violent attacks launched in Europe represented the same "alien culture" (i.e. Islam), regardless of whether the attack was in any way related to jihadism or Islam, or whether the attacker was a second or third-generation immigrant born in Europe became widely adopted. The perception of threat intensified, the European citizens' overall sense of security diminished, and threats emerging in various areas of security (terrorism, identity, migration, etc.) seem to converge into a form of threat – often left unspoken, but latently present in the background – posed by "Islam as an alien culture", further amplifying the process of involving Islam in the discourse about security that started about two and a half decades ago.

[8] Determining the extent of the "actual" threat with any degree of accuracy is extremely difficult because there are hardly any objective benchmarks.

Conceptual foundations: Islam, Islamism, jihadism

The meanings of Islam

Experts studying the subject for a long time do not even agree on the proper terminology or on the exact and clear meaning of the individual terms. Also, the word *Islam* itself is used to represent different things. Islam is first and foremost a religion, one of the three great monotheistic religions in the world. Second, Islam is a civilization (or, in other words, a cultural system), and this meaning is different from the previous one. These interpretations are complemented by a third one, a meaning that many people apply to the entirety of Islam: Islam as a political system or political Islam *(al-Islam al-siyasi).* Although the past decades were indubitably characterized by the politicization of Islam, political/politicizing Islam does not represent the entirety of Islam (i.e. it is not the third meaning of the word *Islam*) rather a trend that involves the use of Islam explicitly for political goals, which is most befittingly called Islamism.

One of the characteristics of the image of Islam that formed in the past decades in the West is generalization. Islam as a religion is not monolithic (in addition to the prevailing Sunni-Shia opposition, there are several other, sometimes starkly conflicting factions in addition and within these two branches), and as a civilization it is even more differentiated. There are huge differences between the individual civilizational/cultural subsystems of the Islamic civilization (e.g. between the Saudi-Arabian and Indonesian Islam, etc.).

Different interpretations of Islam

Among experts studying Islam there are two different interpretations of Islam, which differ in essential aspects and, as a result, come to conflicting conclusions in their assessment of certain subjects relating to Islam on account of their differing starting points – both of these interpretations are often encountered in Hungary in relation to, among other things, the migrant crisis. One of them could be called traditional, orientalist/Arabist or essentialist interpretation, the other one could be called social science based or pluralist interpretation of Islam. The former is represented by experts who have a degree in orientalism/Arabism, while the latter is embraced by those who approach Islam and the Islamic world from the disciplines of social sciences. The former use Islam and the Islamic system as their starting point and the subject of their studies, while the latter focuses on the actual social, economic and political conditions, and the changes that take place in the Islamic world.

The first approach regards Islam in a holistic/totalistic way, based on essentialist-culturalist considerations, and treats it as a closed and coherent system which determines every aspect of Muslims' behaviour, explains everything that Muslims do, either in the Islamic world or in Europe. The behaviour, responses and expressions of Muslims can be understood on the basis of Islam. Islam as some sort of "Islamic continuum" is a central, definitive element of Muslim history spanning more than 1400 years. This methodology

approaches the subject from "within", from the normative dimensions of Islam[9], and uses an ideal-typical – or rather, utopian – model of Islam[10] which exists only at a theoretical level at best as the actual practices in the Islamic world never corresponded to those of this model.

According to the other, pluralist view, there is no Islam as a closed system other than in the form of a hypothesis or a utopia. Islam has never existed in itself, Islam has always been represented and embodied by various personalities, such as theologists, experts of religious laws, organizations, movements, etc., each subscribing to their own interpretations of it. The world of Islam today is characterized by competing interpretations or, paraphrasing Huntington, "the clash of interpretations". Each interpretation attempts to present itself as the representative of the true, authentic Islam. One of the most important characteristics of Islam has always been its diversity, the variety and plurality of its interpretations and the ways of expressing itself.

Throughout the history of Islam spanning nearly 1400 years the actual practice never corresponded to the essentialist and ideal-typical image of Islam. (This is the reason why Islamists have been attacking the current political system for decades as, according to their claims, they fail to follow the principles of Islam. As a result, their goal is to establish an Islamic State, which, of course, has never been clearly defined, and to Islamize the political, social and economic sphere.) Dynastic empire that was the hallmark of the history of Islam did not follow the principles of Islam. "As a political and civilizational project, the entire history of Islam was dominated by realistic political calculations" (Halliday, 1995: 118.)[11] and it is still defined by political calculations, attempts at enforcing various interests and geopolitical considerations. The monolithic image of Islam is squarely contradicted by the cultural and political diversity of the Islamic world – the actual practice. Of course, it would be a serious mistake to ignore the role of Islam, we only question its exclusivity.

Islamism

Islamism is an activist movement that manifests itself in the activities of different organizations, relies on a special political ideology and uses Islamic religious and cultural symbolism to wield religion or rather, their own strangely misrepresented version of Islam fabricated

[9] "Is it possible to introduce profound reforms in a Muslim society? Probably not, because such reforms would mean breaking away from a predominantly Islamic character that provides the roots of the society and builds on a *ne varietur* Quran, prophetic tradition and Sharia", argues Róbert Simon (2014: note 12 & 13). Elsewhere he emphasizes the same: "This makes it probable that essential elements of an Islamic society cannot be reformed as the foundations of Islam are untouchable, but meaningful social reform could only be implemented through an in-depth critical reform of the latter" (Simon, 2016: 183.). "We are dealing with a closed system of thinking from which single areas cannot be separated and reformed. On the other hand, as customs and practices of Islam are sanctified by commandments originating from God, they are inherently and universally irreformable", argues Miklós Maróth (2002).

[10] "Imagined" or "imaginary" Islam (Roy, 2007: 42.).

[11] It is an often cited example that Ayatollah Khomeini, the top religious leader of Iran, wrote a letter in January 1999 to the incumbent president of Iran, Ali Khamenei (who is now the number one religious leader of Iran) in which he called his attention to the fact that the interests of the state should be given priority over those of Islam and Islamic law, and if necessary they override the ordinances of Islam, including the "pillars" of Islam (fasting during Ramadan, haj, etc.) (Ruthven, 2007: 91.).

from certain cherrypicked and misconstrued elements of it, in order to achieve political goals. Islamism is a form of instrumentalization of Islam by individuals, groups or organizations to pursue political goals (Ayoob, 2008: 2.). Islamism is a very recent phenomenon which offers an adequate response to the challenges of globalization and modernity. (Many experts consider equate Islamism to political Islam.)

A collective term that has been in use for a long time but with a changing definition is Islamic fundamentalism, which was originally a religious initiative that aimed to return to the purity of the origins, although it also laid down political objectives. Today most of the experts still refuse to make the distinction between Islamism and Islamic fundamentalism (Kramer, 2009: 1.; Tibi, 2008: 120.). However, it is reasonable to draw a line between "classical" Islamic fundamentalism and "modern" Islamism by defining the latter as groups, movements and organizations which are driven predominantly by political and ideological goals underpinned by religious elements that are given a particular interpretation. Róbert Simon draws the line between Islamic fundamentalism and Islamism by claiming that the former stays between the boundaries of Islam and strives first and foremost to restore the purity of the origins while the latter mostly covers political movements seeking to find a way to address the challenges of globalization, which have barely anything to do with the original roots of Islam (Simon, 2014: 12.).

Islamism is regarded by many as a radical violent movement or organizations. Some of the experts also tend to treat Islamism as a homogeneous monolithic movement and consider every Islamist a "potential killer" (Pipes, 2012),[12] and compare Islamism to fascism or Marxism-Leninism (Pipes, 2000). The situation, however, is much more complicated. It is more appropriate to choose a sophisticated, differentiated approach as there is a moderate and a radical wing of Islamism (jihadist Islamism or jihadism). Moderate Islamist organizations foreswore violence and adapt to the "rules of the game" in order to seize power in a peaceful way (e.g. by participating in elections) (for example, Ennahda in Tunisia or the main branch of the Muslim Brotherhood in Egypt). Recently it is noticeable that many Islamist organizations transformed themselves from terrorist organizations steeped in violence into political parties (for example, the Hezbollah in Lebanon).

The Islamist movement, and even its radical branch, jihadism, is extremely fragmented, divided by deep fault lines, and not united either in its goals or its methods. Rivalry, disagreements, conflicts and sometimes even armed clashes between individuals and groups are everyday occurrences within Islamism and jihadism.

[12] "All Islamists are one. A moderate Islamist is as fantastical a notion as a moderate Nazi. Every member of this barbaric movement is a potential totalitarian thug."

Jihadism

Theoretical foundations: Sayyid Qutb and "permanent jihad"

In contrast to moderate Islamism, jihadism sees violence as the appropriate method to achieve its goals. The theoretical foundation for it was developed by the indubitably most influential theoretical-ideological founder of jihadism, the Egyptian Sayyid Qutb.[13] He is credited with working out a theory of Islamic revolution, the creed of which was the "*What is to be done* of the Islamist movement" (Kepel, 2007: 54.), the book Milestones/Signposts Along the Road *(Ma'alim fi al-Tariq)* that Qutb wrote in 1964 in prison.[14]

Sayyid Qutb applies the word *jahiliyya* that was used to describe the period of ignorance and barbarism before the advent of Islam, to the contemporary world, including countries that call themselves Muslim. "We are also surrounded by Jahiliyya today, which is of the same nature as it was during the first period of Islam, perhaps a little deeper. Everything that surrounds is […] Jahiliyya. […] Our mission is not to compromise with the practices of Jahili society, nor can we be loyal to it. […] Our aim is to first change ourselves so that we may later change the society." (Kutb, 2014: 285–286.).

This change could be the result of a "permanent jihad". The religious layman Qutb reinterprets jihad in a way that can be tagged as a heretic innovation in terms of classical Islam: as a permanent fight against internal and external enemies, and as a personal obligation. "It is a permanent state and not an occasional situation [...], which makes the liberating Jihad mandatory until the only religion is Allah's" (Qutb, 2014: 285–286.).

Waves of Jihadism

The evolution of jihadism, which spans a few decades, is characterized by three waves (Gerges, 2014: 339-343.). The *first wave* was dominated by the followers of Sayyid Qutb, the key ideologist of jihadism. Their primary target was the "near enemy"[15], which meant the local, Middle-Eastern secular political governments and those friendly to the West from Egypt to Syria. They launched a series of armed attacks in quite a few countries in the Middle-East, and attempted to overthrow the incumbent political powers. These attempts

[13] Sayyid Qutb was the leading ideologist of the Egyptian Muslim Brotherhood. He was executed on the order of Egyptian President Nasser, along with several other leaders of the Brotherhood in 1966.

[14] See in Hungarian: Qutb, 2014. jihadist ideologists and leaders of jihadist organizations, for example, Mohammed Yusuf, founder of Boko Haram often cite Sayyid Qutb. Ayman al-Zawahiri, the second general emir of al-Qaeda and one of its key ideologists was an "admirer" of Sayyid Qutb. Sayyid Qutb's brother, Muhammad Qutb, held lectures on Islam as a university professor at King Abdulaziz University, and among other students, his lectures were attended by Osama bin Laden too.

[15] In the words of Muhammad Abd al-Salam Faraj, ideologist of the Egyptian Islamic Jihad Group "fighting the enemy that is near to us comes before that which is far." (Faradzs, 2014: 450.). "As for the Muslim lands, the enemy resides in their countries. In fact the enemy is controlling everything. The enemies are these rulers who have snatched the leadership of the Muslims. [...] the main reason behind the existence of Imperialism in the Muslim lands is these rulers. [...] to begin with destroying Imperialism is not a useful action and is a waste of time. [...] there is no doubt that the prime field of jihad is to remove these faithless leaderships and replace them with the complete Islamic system, and from here we start." 451–458.).

were all suppressed, sometimes with considerable casualties. One of their attacks that triggered maybe the greatest stir was the assassination of Egyptian president Anwar Sadat in 1981. In many countries, Islamism became the number one oppositional movement against which the political leaders took strong action. It was at that time that Ayman al-Zawahiri who was then a theorist of the Egyptian Islamic Jihad and later became the second leader and, after the death of Osama bin Laden, the actual leader of al-Qaeda, began to operate.

The *second wave* was rooted in the battles fought in Afghanistan in the eighties, and al-Qaeda led by Osama bin Laden became its dominant organization. Essentially, by the middle of the nineties, a new, transnational form of militant Islamism gained momentum: global jihadism (global Jihadist Salafism), which chose the "far enemy" – i.e. the West, and first and foremost the United States and its allies – as its primary target. Certain experts link this development to the Osama bin Laden's fatwa about global jihad that was issued in 1996 (bin Laden, 1996). By then, Jihad was globalized and, as a religious-ideological justification, its defensive and retaliating character – responding to the crimes committed by the West against the world of Islam – was emphasized.[16] Jihadist Islamism that had been involved mostly in local conflicts until then entered the global scene.

The *third wave* still continues these day, with its leading organization, the Islamic State. The leader of the organization, Abu Bakr al-Baghdadi who, unlike the engineer Osama bin Laden and the doctor Ayman al-Zawahiri, has religious qualifications (graduated from the Islamic University of Baghdad) wishes to ensure the religious legitimation and exclusivity of its operations by declaring a caliphate.

Jihadist terrorism as a security challenge

Terrorism cannot be analyzed in itself because it is not an objective but a tool: certain groups and persons resort to violence in order to achieve their goals, thereby generating fear among the civilian population. The perception of terrorism is also controversial: a person who is considered a terrorist by one side is often regarded as a freedom fighter by the other side. Terror always followed humanity throughout its history, and various organizations and groups use it to further their agenda. In Europe there were periods where terror was part of everyday life, for example just a few decades ago in Northern-Ireland, the Basque country, Italy or the Federal Republic of Germany.

Watching the news from media for well over two decades, one might get the impression that all (or the majority) of terror attacks committed in Europe and in the United States are linked to Islam or Islamism. Much less publicity is given to violence and attacks committed by non-Muslims. The facts, however, show a different picture. A report created in 2015 in the United States found that "since the mass murder of 9/11, more people have been killed in the United States by non-Islamic domestic terrorists than jihadists" (SPLC, 2015: 4.). The report states that between 2009 and 2015 a "domestic terror attack" was committed every 34 days on average, and in 74% of the cases, the perpetrators were "lone wolves". Another terrorism research organization attached to the University of Maryland published a report early in 2016 stating that between 1990 and 2014 there were 62 casualties of al-Qaeda related

[16] For a summary of motivations for Osama bin Laden, see bin Laden, 2002.

attacks, while ideologically motivated terror attacks committed by right-wing extremists left 245 people dead (START, 2016).

Only in 2013 14 thousand murders were committed in the United States, and 190 thousand between 11 September 2001 and 2013. The total death toll of Muslim terrorism was 37 in the same period. In 2013, thirty attacks were committed in the United States that killed more than four people. Of these attacks only a single one is linked to jihadists, which was the terror attack against the Boston Marathon that claimed four lives. The death toll of the other terror attacks in 2013 was 137, which is more than three time that number of victims claimed by attacks linked to jihadists after 11 September 2001 (Kurzman, 2014: 2.).

An Europol report in 2015 found that terrorist attacks related to religious and non-religious motives were equally committed in the member states of the European Union, the majority of which was separatist terrorist attacks (Europol, 2015). The reports also calls the attention to the fact that the jihadist threat and the violent acts committed by the Islamic State seriously increase the activity of the radical far right in terms of both authorized (demonstrations) and illegal (violent) acts.

Terror as the tool of radical Islamism

Violence and terror as a tool have been used by radical Islamists (and other Middle-Eastern organizations, including secularized Palestinian groups) from the very beginning. Initially, violent acts of radical Islamism were limited to local targets, including local political authorities from Egypt to Syria that allegedly ignored the ordinances of Islam and – in the case of attacks by Palestinian organizations (such as Hamas) – Israel. The situation is made more complicated by the fact that only a smaller portion of activities carried out by radical Islamist organizations (Hamas, Hezbollah, etc.) involved violence as they mostly performed and still perform niche social-charity activities which significantly contribute to the improvement of the population's quality of life and, as a result, they have serious social support (Hamas in Gaza, Hezbollah in South-Lebanon). As a result, declaring them terrorist organizations *en bloc* is questionable from a certain point of view.

Globalization of jihadism entails the globalization of jihadist terrorism. In this area, al-Qaeda was the pioneer as the prototype of a globalized jihadist terrorist organization. Its operations started to get into the limelight at the end of the nineties (mostly on account of the attacks launched in 1998 against the US embassies in Kenya and Tanzania), and after the terror attack on 11 September 2001 it became the primary enemy. 11 September 2001 can be seen as a turning point as from that point onward international terrorism became the number one factor threatening security, US President George W. Bush declared war on terrorism, and Europe also started to regard terrorism as the most significant source of threat. In the following years, however, changes occurred, and by the end of the 2000s terrorism slipped back in the rankings of security threats in the Western societies.

This situation changed profoundly due to the events of 2015 in the first place. A survey completed in the spring of 2016 by Eurobarometer showed that migration and terrorism were now ranked as the two most significant and most worrisome sources of threat, and it was especially in the case of the latter that the survey showed the considerable increase compared to the surveys of the previous years (Eurobarometer, 2016).

Global jihadist terror organizations (al-Qaeda, Islamic State)

Today there are quite a few jihadist organizations that use violence and terror as a means to achieve their goals. (Suicide bombings have become an almost everyday occurrence, and they also became a hallmark of combat activities in, among other things, Iraq and Syria.) Most of these attacks, however, still remained localized (for example, the Syrian al-Nusra Front[17] that operated for a long time as a local branch of al-Qaeda), and two organizations entered the international scene: al-Qaeda and the Islamic State. The influence and effectiveness of al-Qaeda noticeably diminished in the past years, in part due to the disruption of cohesion within the organization (several leaders were killed), in part because of the emergence and spreading of new, rival organizations, first and foremost the Islamic State (NCTC, no date).

The primary target of al-Qaeda was always the West, and they prioritized attacks against the West at various locations around the world. The main reason for this approach is not religious but political-ideological, namely the "protection" of Muslim areas from the United States and its allies or, as bin Laden put it, "the Crusader-Jewish alliance". "[T]he ruling to kill the Americans and their allies – civilians and military – is an individual duty for every Muslim who can do it in any country in which it is possible to do it", declares a fatwa issued by the World Islamic Front (full name: World Islamic Front for Combat Against the Jews and Crusaders) with bin Laden in its ranks in February 1998 (World Islamic Front, 1998).[18]

The Islamic State shows a different picture. This organization is specifically a product of globalization, it is modern in its communication, its activities combine advanced revolutionary and ancient Islamic traditions, and its revolutionary character and the ruthless terror are reminiscent of the Jacobins, Bolsheviks or even the Red Army Faction. Borrowing and improving on a lot of things from al-Qaeda, the Islamic State "re-territorialized" the fight by focusing its operations on "state building" in Syria and Iraq while maintaining its internationalized and globalized dimensions, first and foremost in the area of communication and recruitment, and by establishing the caliphate. The difficulties encountered and the air strikes of the international coalition diverted its attention towards attacks on the West and mostly on those launched in Europe.[19] With these attacks its declared goal was to "punish" countries that actively participated in the coalition against the Islamic State.

Both al-Qaeda, and the Islamic State set up a network spanning many countries around the world, consisting of formal or informal local organizations – cells – and individuals.

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[17] Leaders of jihadist organizations often exhibit a great deal of pragmatism, which often overrides their ideological convictions. For example, the leadership of al-Qaeda explicitly forbade the al-Nusra Front operating in Syria to attack the West – either the United States or Europe (al-Golani, 2015; BBC, 2015). In July 2016, the al-Nusra Front "officially" broke away from al-Qaeda and chose a new name, indicating that it intended to play a leading role in the Syrian opposition (Jabhat Fatah al-Sham, Front for the Conquest of the Levant).

[18] The fatwa identifies three main reasons: 1. The United States has been occupying the lands of Islam in the holiest of places. 2. [...] the great devastation inflicted on the Iraqi people by the crusader-Zionist alliance, and [...] the huge number of those killed, in excess of 1 million... 3. The Americans' aim [...] is also to serve the Jews' petty state and divert attention from its occupation of Jerusalem..

[19] On 21 September 2014 the spokesman of the Islamic State, Abu Mohammad al-Adnani, called on Muslims to kill Westerners and their allies, either soldiers or civilians, with a special emphasis on the countries partaking in the coalition against the Islamic State (al-Adnani, 2014).

Some of them were organizations, created earlier in the given country and operating in an organized way, which pledged their loyalty to the mother organization (Boko Haram, al-Shabaab, etc.). There are also individuals or scattered groups of individuals that consider themselves members of the central organization or network on the ideological basis of jihadism. There are people among them who, during their stay in Afghanistan, Syria, Iraq, etc., made contact with a member of the mother organization, but there are others whose only connection to the latter is the shared ideology.

In addition to the common ideology, the role of the "brand" became just as important. An important objective of terror is to create fear, and this goal is easier to achieve if strikes are launched by "dreaded" organizations that carried out a series of successful terror attacks. For this reason, even unaffiliated persons tend to call themselves members of these organizations and on the other hand, organizations are quite eager to assume responsibility for attacks launched by people outside their organizations as these acts improved their "reputation". Such attacks, some of which requires considerable preparations and organization, cannot be coordinated from a central location several thousands of kilometres away, even with advanced communication technologies. Most of them are acts on local initiatives or decisions.

Sources of jihadist terrorism

The base of jihadist terrorism consists of jihadist organizations that operate in the area of the broader Middle East (or *Greater Middle East* as the Americans call it). The root causes include local, regional and global problems that have been unresolved for decades and have a negative impact on some of the countries in the region and on certain social classes and groups. Even though these are movements that originally sprang from religious motivations and their starting point was allegedly their objection to the local political leaders' and certain social classes' failure to abide by the commandments of the religion – namely, Islam – or the "occupation of Muslim land", subjugation and exploitation of Muslims by the West, economic, political and social problems that have remained unresolved for decades also contribute to the support for these movements and organizations.

The most significant internal opposition of autocratic political regimes that are in power in most of the countries of the Middle East has been Islamism for many decades now, which the former usually radically oppress, often even in cases where Islamist organizations/movements come to power in a (quasi) democratic way, i.e. via elections (see the army's intervention in Algeria at the beginning of the nineties, or the blocking of Hamas from forming a government in the Palestinian territories or the Egyptian political leadership's crackdown against the Muslim Brotherhood). "Official" ideologies represented by certain countries in the Middle East –first and foremost, the Saudi Wahhabism – are very close to jihadist ideology. For decades Saudi-Arabia made considerable efforts to spread Wahhabism even outside the Islamic world (through sizeable financial aids), and in this way they inadvertently supported the jihadist movement.

Armed conflicts and civil wars that break out, in part, due to Western intervention and, in part, because of internal reasons, and the severe weakening – or even failure – of the state create a hotbed for various jihadist organizations to build up their bases (Afghanistan,

Yemen, Libya, Iraq, Syria, Somalia, etc.). In that regard, Afghanistan and al-Qaeda as well as Syria, Iraq and the Islamic State have been playing a significant role. The explanation is that these cases signify "pan-Islamic" matters that attracted thousands of fighters from various countries of the Islamic world (and from the outside, including Europe).[20] Their return to their countries of origin raises the threat of terrorism considerably.[21]

Second and third-generation Muslims who were born and raised in European countries and are native speakers of the language of their countries proved to be an increasingly important source of jihadist terrorism in the past years. The reasons for their conversion into terrorists are extremely complicated. The most important factor is the lack or failure of integration into the hosting society and the resulting frustration and identity crisis. Certain radical imams who are present in Muslim communities and the followers who gather around them may also contribute to the process, but the role of the media and the Internet cannot be ignored either.

Targets of jihadist terrorism: The vulnerability of Europe

In the case of jihadist terrorism, we are dealing with threats, security challenges and security risk factors that manifest themselves at local, regional and global levels. Radical Islamism/jihadism and the associated terrorist activities do not only pose a serious security challenge to the West, including Europe, but also to the Islamic world where attacks claiming dozens or sometimes even hundreds of lives – most of whom are Muslims – are launched almost every day from Lebanon through Iraq to Afghanistan and Bangladesh and where there are armed clashes with extremist jihadist organization in several countries.

Trivializing the issue of terrorists threats to Europe should absolutely be avoided as we are facing a serious problem, however, it must be stressed that even though jihadist terrorism is a terrible tragedy, it does not present an existential threat to the West, including Europe. The real problem is not terrorism itself – or rather, not terrorism in the first place – but the reaction produced by acts of terrorism. Fear, sometimes exaggerated panic responses, sensationalist reporting of the events by certain media outlets, and statements made by some of the politicians and experts[22] serve the jihadists' interests in that they ascribe more power and influence to these groups that what they really possess, thereby furthering their goal of instilling fear into the public and providing them with the publicity they desire.

This is the reason why the practice of claiming responsibility for attacks they have probably nothing to do with, which was previously employed by al-Qaeda, has been adopted now by the Islamic State too. It is undeniable that Jihadism has an ideology that can be linked to a single dominant organization or network (during the "supremacy" of al-Qaeda it

[20] Those acting in the name of the entire Islam, as a representative of Islam or in defence of Islam can expect a lot of sympathy and support. It is no wonder that a lot of leaders from Saddam Hussein to Osama bin Laden – including both "secular" political leaders and leaders of Islamist/jihadist organizations – used this rhetoric, often with considerable success.

[21] According to the president of the German Federal Criminal Police Office (BKA) by the middle of 2016 about the third of 810 persons who left Germany to join the fighters of the Islamic State returned to Germany where there were about 500 suspected terrorists on record (BKA, 2016a).

[22] For example: "the West is at war with Islam", "Europe has become a battleground".

was called "al-Qaedaism"), which attracts a lot of people.[23] One of the strengths of jihadists is their political-ideological capacity to mobilize others, which is compared by some experts to that of the "Leninist revolutionary vanguard party" (Tibi, 2008: 120.). If this capacity is administered into the pool of frustration, failure of integration, identity crisis and, occasionally, additional mental disorders, many people can be seriously drawn to its allure, and it might also provide enough motivation for a few "lone wolves" to commit a terrorist act even if the person has no real connection to the Islamic State.

The majority of the victims of globalized jihadist organizations (al-Qaeda, Islamic State) operating in the international arena are Muslims. According to a report of the National Counterterrorism Center in the USA covering the period between 2005 and 2010, 82 to 97% of the victims of terrorist attacks linked in some way to religious motives or to a religion were Muslims (NCTC, 2012: 14.). In the same period, terror attacks by al-Qaeda claimed seven times as many Muslim victims as non-Muslim victims: Western casualties amounted to 15 percent of the total number of people killed (CTC, 2009: 2.). The UN report reveals that the overwhelming majority of the victims of the Islamic State in Iraq were Muslims (OHCHR, 2014). In the USA a joint government-university program studying terrorism *(Global Terrorism Database, GTD)* indicates that between 2004 and 2013 half of the terror attacks (and 60% of the casualties) were concentrated in three countries – Iraq, Afghanistan and Pakistan – of the Islamic world. One of the persons working on the program claimed that even though it is impossible to declare with absolute certainty that 95% percent of terrorist attack victims are Muslims, this percentage is very close to reality (Miller, 2015).

The Religion of Peace collected data about terrorist attacks linked to Islam that were committed in 2016 (between 1 January and 16 July). In fifty countries, there were 1274 attacks (including executions by the Islamic State) with 11 774 people left dead and 14 303 injured. Of these attacks, there were five in France (86 dead, 207 injured), four in Germany (two dead, seven injured) and three in Belgium (35 dead, 223 injured) while hundreds of casualties were claimed by attacks in predominantly Muslim Asian and African countries. (Religion of Peace, 2016).

[23] The befitting name coined by Lee Harris for the ideology of al-Qaeda – "fantasy ideology" (Harris, 2002) – is also applicable to the ideology of jihadism and even to Islamism as they have very little to do with reality and they do not offer true alternatives. This perception was changed to a certain extent by the "national and state building" concept of the Islamic State.

Islam and jihadism

Is jihadism Islamic?

Jihadist organizations and their theorists prefer to parade as representatives of Islam (the "true" Islam), a "vanguard", or the protectors of Islam and of the Muslims. However, their acts are in stark contrast with their posturing since, as we have already seen, most of their victims are Muslims, even if they attempt to justify it by claiming that they were either apostates, martyrs or collaborators. In fact, the overwhelming majority of Muslim religious scholars blames jihadists for distorting the teachings of Islam and declare their actions contrary to Islam. The views differ as to what extent jihadist organizations can be regarded as actual representatives of Islam. In that regard, the question arises: what is "true" Islam, what is the "authentic" Islamic position?

Interpretation has a central role in Islam. This applies to all written records that constitute the cornerstones and primary sources of the religion, such as the Quran and *Hadith*. Various statements in the Quran are subject to constant debates and interpretations.[24] Islam does not have a religious centre – similar to Vatican – and in Islam there is no so called church either. There is, however, a class of learned religious scholars and experts of religious laws (*ulama* and *fuqaha*) who, thanks to their education, are the most experienced in the theological questions of Islam. At the same time, there are respected religious institutions and religious scholars whose opinion weighs strongly when an "Islamic" position is formed. In Sunni Islam, such institution is Al-Azhar Mosque and University and other institutions attached to it, and in Shia Islam *Hawza* (Shia seminars) in Qom, Najaf and Karbala.

So how can anybody make a statement in an issue such as, e.g. whether or not al-Qaeda, the Taliban or the Islamic State is Islamic or can be considered a representative of Islam? Barack Obama stated about the Islamic State, Bill Clinton about the Taliban, and George W. Bush about al-Qaeda in connection with 9/11 that they do not represent Islam.[25] However, according to Daniel Pipes, an American expert on Islam, a non-Muslim (especially a politician) has no competence in deciding on what is Islam and what is not. Furthermore, the above organizations consider themselves authentic Islamic organizations, and they constantly emphasize this fact. "Anyone with eyes and ears realizes that the Islamic State, like the Taliban and al-Qaeda before it, is 100 percent Islamic. If somebody claims that he is a Muslim, I am ready to believe his worlds" (Pipes, 2014).

Indeed, it would be a mistake to claim that jihadism that resorts to terror and violence has nothing to do with Islam. There may be – in fact, there is – an interpretation that uses arguments based theology and religious law to justify even the most extreme forms of violence. That is what the Islamic State does. Leaders of jihadist movements are keen to quote Ibn Taymiyya who lived in the 13th and 14th century and belonged to the most rigid legal branch of orthodox Islam, the *Hanbalites*.

It is an undeniable fact that there are verses in the Quran that encourage violence (9:5, 47:4, 8:60). However these verses cannot be interpreted out of space and time as they were

[24] As Olivier Roy so aptly put it: "the key question is not what the Quran actually says, but what Muslims say the Quran says" (Roy, 2004: 10.).

[25] "We are not at war with Islam – we are at war with people who have perverted Islam", claimed Barack Obama *(Barack Obama says US..., 2015).*

written in a given historical context, mostly before some crucial battle when Muslims were fighting a life-or-death battle with the Meccans for survival. It is also a fact that there is no world religion in the name of which inhuman acts and violent atrocities have not been committed. Retaliation that jihadist often cite, i.e. the "an eye for an eye" principle is also not exclusive to Islam. [26]

In addition to who a person thinks they are, it is just as important to know who others – in this case, learned religious scholars or the community of Muslims – think they are. The absolute majority of the religious scholars of the Islamic world do not consider the Islamic State Muslim, and regard their activities as explicitly harmful to Islam (*A collection of the words... 2015;* Hasan, 2015). From a religious point of view, the Islamic State has absolutely no support in the world of Islam, and the caliphate of al-Baghdadi is not recognized by religious scholars who declare the acts of the Islamic State contrary to Islam.

The Islamic State's exclusive interpretation of Islam

A clear understanding of the ideology of the Islamic State can be achieved by studying the publication of the organization *(Dabiq)*, the statements of its leaders, and the actual operations of the organization. The Islamic State considers Islam or rather an orthodox Sunni branch of it, as its religion, and only as it is interpreted by the Islamic State. Everybody who follows either a different religion or who is a Muslim but fails to accept Islam as interpreted by the Islamic State is considered an unbeliever or an apostate, regardless of whether they are a Shia or a Sunni.

The Islamic State and the Muslims

On 29 June 2014 the leaders of the Islamic State declared the restoration of the caliphate and proclaimed Abu Bakr al-Baghdadi caliph.[27] With this symbolic act the Islamic State intended to extend its jurisdiction to all Muslims around the world. Five days later "Caliph Ibrahim" aka Abu Bakr al-Baghdadi delivered a speech in which, as a symbolic act, he quoted from the speech of Abu Bakr (the first caliph of Islam after Muhammad's death). By establishing the caliphate, al-Baghdadi has become (theoretically) the caliph of all Muslims, which means that, by elevating itself above other jihadist organizations, the Islamic State declared itself the religious leader of the Islamic world as well as the leader of jihadist organizations. This put a chink in the legitimacy of al-Qaeda (they were called on to disband and join the Islamic State), the authority over all jihadist group was handed over to the Islamic

[26] "Whoever kills a soul unless for a soul or for corruption [done] in the land – it is as if he had slain mankind entirely." (Quran, 5:32). While: "And he that smiteth any man mortally shall surely be put to death." (Bible, The Third Book of Moses, 24:17).

[27] The institution of caliphate was created after the death of the prophet Muhammad in 632 CE *(Khalifat Allah* = "steward of God") and endured almost 13 centuries until 1924 when it was abolished by the national assembly of Turkey under the presidency of Kemal Atatürk. The caliph was considered the spiritual leader of the entire Islamic world.

State, and Baghdadi stated that emigration *(hijra)* to the territory of the Islamic State is an obligation of all Muslims.

"In reality, there are only two religions. There is the religion of Allah, which is Islam, and then the *religion of anything else,* which is *kufr (unbelief).* […] So whatever is not Islam is not the religion according to Allah and it will never be accepted. […] Therefore, anyone who falls into kufr has left Islam, even if he claims to be a Muslim." (Dabiq, 2016a). Apostasy *(ridda)* is an important category used by the Islamic State, which does not just mean a Muslim who became a Jew, a Christian, a Hindu or a Buddhist or a follower of any other religion but also anybody else who became an apostate Muslim because they refused to subscribe to the Islamic State's interpretation of Islam.[28]

The immediate target for the Islamic State is the "apostate" organizations and persons of the Islamic world against which/whom the organization openly declared war. Such organizations and "target persons" include representatives of the broadest religious and ideological sphere, with a great number of Sunni in addition to the Shiite! Such a target is the Kurdish *"communist murtaddin"* PKK/YPG (Dabiq, 2014a), the "party of extreme apostasy, [...] the Muslim Brotherhood, a devastating cancer spreading and attempting to drown the entire Ummah in apostasy, including its factions, branches and "Islamic' centres" (Dabiq, 2016b). The photos illustrating the lengthy essay about the Brotherhood tag quite a few Muslim personalities as *"taghut"*[29], the synonym of evil (Ali Khamenei, the top religious leader of Iran; Turkish president Erdogan; Haniyeh, the leader of Hamas; former Egyptian president Mubarak, etc.) and the leader of al-Qaeda, al-Zawahiri, is nothing more than a "soldier of the Pakistani puppet Akhtar Mansur"[30]. The Islamic State treats "apostate" tribes as a homogeneous unit and employs collective punishment against them (Dabiq, 2014b). Issue#14 of *Dabiq* released in April 2016 called upon the Muslims to "kill the imams of Kufr in the West" (Dabiq, 2016a). The list of targets include mostly Sunni religious leaders living in the West who strongly criticized the activities of the Islamic State.

The Islamic State does not accept al-Azhar in Cairo, which is globally recognized as the most influential institution of the Sunni branch of Islam, as an authentic representative of Islam because, since the caliphate was "re-established" in 2014 with Abu Bakr al-Baghdadi as its head, only the latter can represent Islam. It talks about the religious leaders of Sunni Islam as "apostate scholars of al-Azhar and Medina, who, instead of staunchly opposing "shirk"[31], lead religion into a "satanic" direction (Dabiq, 2016c). The Islamic State declares Sheik Ahmed el-Tayeb, the Imam leading al-Azhar an apostate, and in their publication the following caption was added to a photo depicting a meeting of Pope Francis and Sheik Ahmed el-Tayeb: "The Crusader Pope Francis and the apostate Ahmed el-Tayeb."

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[28] Declaring someone an apostate is one of the most severe sanctions *(takfir)* of Islam.

[29] Originally it was the name of an idol in the pre-Islamic period, which later became a synonym of satan or devil.

[30] After the death of Mullah Omar, Akhtar Mansur became the religious leader of the Taliban and it is to him that Ayman al-Zawahiri, the leader of al-Qaeda, pledged his fealty. (On 21 May 2016, Mansur was killed in a US drone attack and was succeeded by Hibatullah Akhundzada as the Emir of the Taliban.)

[31] Association, i.e. polytheism, one of the most negative categories in Islam.

The Islamic State and Christians

Many believe that there is a religious war in Europe, which is, in fact, a war waged by jihadism against Christianity. Some of those who adopted this view went even further and talked about a war between Christianity and Islam. There is no denying that the Islamic State committed a series of brutal acts against Christians living in Syria and Iraq, however, the same brutality was brought to bear against Muslims that did not share their interpretation of Islam.

The publication of the organization berates Christianity and Judaism in a series of lengthy theological commentaries. The scriptures that Moses and Jesus received (the Torah and the Gospel, respectively) were not preserved in their original form, but they were lost and replaced by forgeries. Instead of the "Gospel of Jesus", there is a version attributed to Matthew, Mark, Luke and John, which sometimes contradict each other. The Trinity is "one of the pillars of the pagan Christian theology" as all three persons are Gods themselves (Dabiq, 2016d).

Similar to al-Qaeda, a generalized image of the West shares the focus of the Islamic State's hatred, in part, due to religious and, in part, due to other reasons. The publication of the organization described in several points why they hate the West. "We hate you, first and foremost, because a) you are disbelievers; you reject the oneness of Allah; b) We hate you because your secular, liberal societies permit the very things that Allah has prohibited while banning many of the things He has permitted; c) you disbelieve in the existence of your Lord and Creator, and you refer to physical laws that govern the Universe; d) you commit crimes against Islam and we wage war against you to punish you for your transgressions against our religion; e) you commit crimes against the Muslims; your drones and fighter jets bomb, kill, and maim our people around the world, and as such, we fight you to stop you from killing our men, women, and children; f) you invade our lands and we fight you to repel you and drive you out. As long as there is an inch of territory left for us to reclaim, jihad will continue to be a personal obligation on every single Muslim." (Dabiq, 2016e).[32]

Fault lines in jihadism

Since its inception, jihadism fought a war on two fronts: on the one hand, against the political leaderships of the countries of the Islamic world that disregarded Islam and, on the other hand, against the representatives and religious leaders of the so called institutionalized Islam that consort with political leaderships. There are, however, deep dividing lines not only between jihadism and the religious leaders and leading religious scholars of Islam but also between the individual jihadist groups and organizations. Even Sayyid Qutb who laid down the foundation of the ideology was harshly criticized by conservative religious scholars – by Saudi Wahhabis in the first place – for being a "reformer" who treats the holy scriptures with too much liberty and whose interpretations include unacceptable inventions.

As there is no religious centre in Islam, Islamism and its radical wing, jihadism, has no centre, central body or any other institution either that would represent a uniform position. "There has been no Islamist or jihadist "Comintern" or "Islamintern" similar to that

[32] The publication discusses these points in more detail, but we chose to stick to the most essential parts.

of international Communism that was set up after World War I in 1919. (Gerges, 2005: 117.). Neither Islamists nor jihadists were able to move beyond their differences and unite in a "common front", and they could not even agree on a common leadership. "Religious nationalists" were fragmented from the start, and they fought for local goals in local territories, and even though transnational jihadists escalated their operations to the global stage, their movement has not become any more cohesive. They are still dominated by the views of autocratic leaders and actual persons, with a great emphasis on personality and charisma.

Within Islamism and jihadism the global jihadist strategy and specific actions of al-Qaeda were subject to strong criticism. For example, Sayyid Muhammad Hussein Fadlallah, the founding spiritual leader of Hezbollah in Lebanon, criticized al-Qaeda on a few occasions, rejecting, among other things, the claim that suicide attacks committed by the organization were "martyr attacks" and for this reason they are legitimate (Gerges: 2005 237-238.). According to Fadlallah, these were terrorist attacks because while similar attacks launched by Hezbollah in the early eighties could be regarded as legitimate from a religious perspective as they combatted Israeli occupation, al-Qaeda attacks against Americans are not legitimate as the USA does not occupy Muslim territories and does not oppress or kill Muslims. Gerges cites a long list of Islamist and even jihadist organizations and their leaders which/who harshly condemned the internationalization of jihad and the attacks of al-Qaeda, in particular 11 September 2001, and even declared them contrary to the fundamental principles of Islam (Gerges, 2007: 214–221.).[33]

The caliphate could have provided serious legitimation to the Islamic State on religious foundations, ensuring its primacy in the Islamic world. But that is not how it happened. The majority of the Islamic world rejected the caliphate of al-Baghdadi. From the start al-Qaeda refused to accept the Islamic State as a caliphate, and treated it the same way as any other local jihadist groups. They did not consider al-Baghdadi a leader who had the qualities of a caliph. On 2 February 2014 al-Qaeda officially distanced itself from the Islamic State and went even further: they appointed a "anticaliph" in the person of Mullah Muhammad Omar.

The calculations of the chiefs of the Islamic State that with the symbolic move of proclaiming the caliphate they would rally the Muslims to their cause failed. The twisted interpretation of Islam, the brutality of the organization turned the leading religious scholars against it, who declared the Islamic State a terrorist organization and its actions contrary to the tenets of Islam *(Muslim Voices Against…, 2014; A collection of the words…, 2015).* Ahmed el-Tayeb, the Grand Imam of the al-Azhar, the most reputable institution of Sunni Islam, called the ideology of the Islamic State unreconcilable with Islam and the organization barbarian (Al-Azhar, 2014). Even Hassan Nasrallah, the leader of the Lebanese Hezbollah, an otherwise radical Islamist organization, turned against the Islamic State, claiming that it posed an existential threat to the entire region and for this reason it must be countered and fought (Nasrallah, 2015).

[33] Karam Zuhdi and Nageh Ibrahim, the leaders of one of the largest jihadist organizations, the Egyptian al-Jama'a al-Islamiya, who were imprisoned for the role in the assassination of President Sadat and for other attacks, condemned al-Qaeda in general, and bin Laden in particular, stating that Islam forbids the killing of civilians and teaches "peaceful coexistence" of religions, particularly when Muslims migrate to foreign lands and are welcomed by inhabitants, which means that al-Qaeda's actions are nothing more than the betrayal of a fundamental spiritual obligation. (Gerges, 2007: 214–221.).

The Middle-Eastern region: a source of security threats

Parallel crises

The region of Middle East is characterized by a crisis situation that has been dragging on for decades. The symbolic defeat of the Arabs by Israel in 1967 drove home the message about the modernization crises that affected a lot of areas and the symptoms of which are still observable in most of the countries in the region. Social, economic and political issues have been unresolved for many decades and are becoming even more serious. The crisis also exposed the failure of secularized ideologies and of the development models based on them, opening the door to re-Islamization that have been an ongoing process ever since.

This was exacerbated in the recent years by the crisis of the state. With a few exceptions, the countries of the Middle East are artificial entities that were not created through a process of organic development but as a result of agreements between the Western powers, with artificially laid out borders. The best example is the Sykes-Picot Agreement which divided the region into British and French spheres of influence and "celebrated" its centenary in 2016. The states of the Middle East lack historical-cultural foundations and the artificially created borders separated culturally cohesive areas, ethnic groups and tribes or turned their members into citizens of several countries. Events in the past years clearly exposed the crisis of the state.

Identity crisis can be seen as the third factor. As a result of a social structure in the Middle East that differs from the European at key points, we can encounter inherently complicated and complex "multiple" identities (ethnic, tribal, national, large family, pan-Islam, pan-Arab, etc.) and the hierarchy of identities might change or be reshuffled occasionally. This is what we experienced in the past period when the emphasis between competing identities shifted considerably, specifically towards identities associated with smaller, more fragmented social units.

Consequences of the "Arab spring": instability, fragmentation, armed conflicts

Of the three parallel but thoroughly intertwined crises, it was the issues ensuing from the modernization crises in the first place (high population growth, unemployment, lack of perspectives for the youth, etc.) that contributed significantly to the outbreak of the series of demonstrations of the so called "Arab spring". In contrast with certain initial expectations, however, the "Arab spring" failed. Not only did it fail to produce any progress in finding a meaningful resolution to the problems but it led to the emergence of new ones. High degree of instability and insecurity overcame the region, the state was shaken – some of the countries were even close to becoming a failed state (Syria, Iraq, Libya, Yemen) – and widespread fragmentation was prevalent as the positions of various non-state actors grew stronger and the fault lines between ethnic groups, tribes, religions and sects deepened.

The conflict between the safety of stability assured by autocratic political powers and the uncertainty of "democratization" was amplified, which posed a serious dilemma for the West too. It was revealed that a "bad leader" could be replaced with an even worse one, and even an anarchic situation that threatens with civil war may arise. Sectarian (Sunni-

Shia) antagonism deepened and so did the political conflicts and the conflicts of interest between the Sunni block led by Saudi-Arabia and the Shiite block led by Iran. Leading Sunni countries feared the threat of a "Shia crescent" and certain experts even started to talk about an imminent "new cold war in the Middle East". In several countries armed conflicts and "proxy wars" broke out, sometimes leading to a civil war and producing extremely complicated and entangled constellation of interests and – in accordance with those interests – alliances. Besides "new" trouble spots, "old ones" have not been resolved either (Afghanistan, Pakistan, Palestinian-Israeli relations), and were even given a new impetus in several locations (rise of the Taliban).

In regard to this unfavourable turn of events it is unavoidable to emphasize the role of the West. The roots of this role go back to the era of colonization and to the aforesaid artificial division of the region. The flawed American (and, on a broader scale, Western) Middle East policy of the 2000s, the responses to 11 September 2001, the war in Afghanistan followed by the declared war on terror, the invasion of Iraq in March 2003 by the United States, the intent to "export democracy" and follow through with a grandiose reformation and democratization of the Middle East, the flouting of local conditions and characteristics that differed greatly from those of the West all contributed directly to the worsening of the situation in the Middle East and to the outbreak of a series of latent conflicts.

Of the consequences, it is worth highlighting at least two: one of them is the rise of radical Islamism (jihadism) which manifested itself in the unprecedented expansion of the Islamic State in the first place, and the second is the wave of refugees. An additional negative consequence of the rise of jihadism is that Islamist discourse was almost exclusively taken over by radical jihadists who enjoyed extensive media publicity: this includes the Islamic State and al-Qaeda in the first place, and their "branch organizations". Moderate Islamist organizations that shunned violence were entirely marginalized, the room for their political manoeuvring became extremely restricted, in part, due to pressures from the political powers and, in part, on account of jihadist attacks. The pervasive activities of the Islamic State, conducted in the name of Islam, did not only discredit Islamism but in the eyes of many it made Islam look intrinsically bad.

Europe: Islam/Islamism and societal security[34]

Societal security itself is a complex multidimensional concept, which first and foremost has social and cultural as well as economic and political aspects. According to the well-known definition of the School of Copenhagen, societal security is "the ability of a society to persist in its essential character under changing conditions and possible or actual threats" (Buzan et al., 1993: 23.). Thus, on the one hand, societal security means social stability and the coexistence of the members of the society in a state that is relatively free of serious conflicts and, on the other hand, preservation of the society's existing or often just imagined collective identity. For many people not only radical and extremists Islamism but Islam itself – and the

[34] At this time we will only examine the aspects of the complex topic of societal security that are affected by jihadism and Islam.

significant population of hosted Muslim minorities – appear as a factor threatening societal security in the European societies.

Intrusion of Islam and its European presence

Basically Islam has been present in Europe since 711. That was when Muslim troops entered the Iberian peninsula at Gibraltar. It was followed by three other great waves: the Mongols conquered the Volga basin and the Caucasus in the 13th century and from the 15 century the Ottoman Empire subjugated the Balkan and the greatest part of Central-Europe, and lastly after World War II the influx of Muslim labour (along with non-Muslim workforce) into the Western-European countries was given a boost. The massive presence of Muslims in Europe became noticeable at the time, and once a distance religion and culture Islam became the part of everyday life. This poses a serious challenge to European national/nation-state identities.

Over the centuries Islam has a dual effect on Europe. On the one hand it posed a challenge and a threat which was countered by appropriate European responses, and on the other hand, acting as a source of spiritual inspiration it had a serious impact on European civilization by handing down and further developing the Hellenic heritage and through its serious contributions to sciences (philosophy, medicine, astronomy, mathematics, chemistry, botany, etc.).

The attitude of modern Europe towards Islam was not unambiguous. The "discovery of the East" took place in Europe in the 18th century, and many people adopted the view that treated Islam as a culture that was equal or even superior to the European. Romanticism was characterized explicitly by the admiration – or at least a positive view – of Islam.[35] This situation changed in a couple of decades. Modernity rearranged Europe's past into a contiguous European history, a "great narrative". The "Europeanization" of Europe or, in other words, the redefinition of Europe's historical past was complete, including the removal of elements from outside Europe even though they played a major role in the culture of premodern Europe.

Visibility of Muslims and the "demographic bomb"

The presence of Islam in Europe is an undeniable fact. In Western-Europe in the member states of the European Union about 20 to 25 million Muslims live,[36] in the Balkans (in Albania, Bosnia-Herzegovina, Bulgaria, Greece, Croatia, Kosovo, Macedonia, Montenegro and Serbia) there are about 9 to 10 million "indigenous" (non-immigrant) Muslims and more than 80 million in Turkey whose geographical and civilizational-cultural association and status are debatable (Europa, Asia or the Middle East).

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[35] The first translation of *Arabian Nights* was completed at the beginning of the 18th century but we could also mention Goethe's *West-Eastern Diwan* or Lessing's *Nathan the Wise*.

[36] The population of hosted Muslim minorities is estimated at 6 million in France, 5 to 5.5 in Germany, 3 in Great-Britain, 1.5 in Italy, 1 in both Spain and the Netherlands, while several hundreds of thousands in other countries.

The proportion of Muslims within the European population was about 5.9% in 2010 according to the data of Pew, which will grow to 8.4% by 2050 without immigration or 10.2% with immigration (Pew, 2015). These percentages did not come to be momentarily but in the course of several decades, and the "migrant crisis" in 2015 essentially caused significant changes in a single country, Germany, increasing the number of Muslims living there by 1 million.

Demographic forecasts and expectations are very different (some people even talk about a "demographic time-bomb") and accordingly issues of greater and lesser concern are raised. Among the Muslim minorities, the rate of birth is higher than among the indigenous population (according to the above referenced Pew study, between 2010 and 2015 the rate of population growth was 2.1% among the Muslims and 1.6% among the Christian population [Pew, 2015]), which, considering the reduction in "indigenous" populace that has already occurred in a number of countries, suggests a further increase in the proportion of Muslims, even without further immigration. The difference, however, is not so significant, according to authoritative sources.

Compared to other minorities, the "visibility" of Muslims is significantly greater as their customs, clothes, behaviour, and some of their buildings show particular difference compared to what is customary in Europe, and are easily recognizable by everybody. It is not a coincidence that in several European countries the use of Muslim signs, symbols and visible signs of their presence are subject to restrictions (prohibition of minarets, burqa and/or niqab). The rootlessness and hopelessness of the second and third-generation youth and the lack of a positive vision of the future pose an actual threat to social stability.

It is especially at theoretical level that concerns are expressed in connection with the threat that Islam – as an alien culture – poses to the ancient collective identities of the European societies and to Europeanism and the European (Christian) culture and values, and with the Islamization of Europe.

Failure to integrate

One of the greatest problems is caused by the failure of integration. This can be stated in general along with the fact that a small part of the Muslim minorities – certainly the smaller part – have been successfully integrated and many of them have even been assimilated.[37] The majority of Muslim communities, however, were pushed to the peripheries and marginalized, living in "ghettos" and parallel societies in the suburbs and the outskirts of large cities. Social indicators are measurably worse among them compared to the *"indigenous" population*. The "hosting" society failed to host them.

[37] Providing a detailed interpretation of the various concepts falls outside the scope of this paper. In the professional literature there are significant differences in terminology, and concepts such as assimilation, integration, segregation and multiculturalism are used by many in a simplified way and with a meaning different from their original interpretation. Societies comprising various cultural communities may pursue the above mentioned four policies in regard to immigrant and other minorities (Rostoványi, 2010: 57-64.). Jürgen Habermas differentiates between political integration that affects every citizen and ethical-cultural integration of groups that have their own collective identities. In his opinion immigrants should only be expected to accept the political culture of their new home country without giving up the culture of their country of birth (Habermas, 1997). In Germany the debate about the "guiding culture" *(Leitkultur)* has been going on for many long years.

Young Muslims who were born in Europe and belong to the second or third-generation suffer from a certain kind of identity crisis. They have already lost contact with the original country of origin of their parents/grandparents and its culture, which is no longer part of their identity as they were born and raised in Europe, and they speak the local language as their native language. At the same time they were unable to integrate into the society of the majority, which had serious reservations about them from the start (this may be due to their own fault or the fault of the hosting society, but the most likely answer is that both are true). They became rootless and frustrated, which is further intensified by the economic and social issues of living in the suburbs. They seek something to hang on to, foundations on which they could build their own self-image. It is almost natural that these young people who seek to establish their identities and believe that they have found it in Islam become servants of radical Islamism.

When looking for the causes of the failure of integration, the often cited theory that Muslims, with a few exceptions, "are not too keen on integration" and do not wish to adapt to the local way of life and habits, choosing isolation instead, is a simplification. This view was not supported by reports and surveys created in the recent years (Rostoványi, 2010: 50–53.; Bertelsmann, 2015). Indubitably there are a lot of such persons among the Muslims but there are also a lot of them who are keen to integrate into the society. However, the process has two sides: openness to integration and willingness to be part of the society are futile if the same is missing from the hosting society. Integration is a two-sided process. If the host society treats them as "aliens" from the outset – or even as potential enemies or as serious security threats –, it will hardly facilitate their integration.

From anti-immigration to "anti-Muslimism"

Rejection of immigration has been present in Europe for many decades, and it is a definitive topic in the program of many right-wing radical parties (Borbély, w/o date). After "Islamic threat" began to dominate the discourse about Islam in the West in the first half of the nineties, the focus of anti-immigration groups shifted towards Muslims and anti-migration sentiment turned into anti-Muslimism in many places (Halliday, 1995: 160.). Anti-Muslimism seems to be an adequate term as in this case it is not necessarily Islam as a religion that is being targeted but – with some simplification – ethnicized Muslims. Islam is considered to be predominantly a culture which – in the essentialist and "culturalist" interpretation of culture – determines the behaviour of a certain group of people – in this case, Muslims –, lending it a specific character that sets it markedly apart from other groups of people.

Ethnicization of Muslims became widespread or – one might say – even universal (Roy, 2004: 126.), which means using the word *Muslim* in its "neo-ethnic" sense in order to treat Muslims as a homogeneous ethnic-cultural group. According to this interpretation, Muslims are part of a common Muslim culture regardless of the significant differences between them, and the nature and the extent of their religious beliefs, and this culture clearly sets the Muslims apart, not as a religious community in the first place but as a pseudo-ethnic group, (Roy, 2004: 126.) from "others" or from "the rest". The actual situation is somewhat more complicated. European Muslims cannot be regarded as a homogeneous group, they do not form a monolithic block. On the contrary, they are very differentiated. Even though

Islam is an increasingly important part of their identity, their ethnic, place of origin-based, sectarian, generational and socio-cultural differences create deep fault lines between them, not to mention their attitude towards the host society or even religion.

Most of the Muslim population in Germany that was born abroad came from Turkey (Turks and Kurds), but a lot of them originate from Kosovo, Iraq, Bosnia-Herzegovina and Morocco too. In France, the former colonies – Algeria, Tunisia and Morocco – are the dominant countries of origin. In Great Britain, the majority of Muslims who were born abroad came from the Asian countries of the former Commonwealth (Pew, 2015b). Anti-Muslimism often turns into Islamophobia. One of the most characteristic examples is the Dutch Freedom Party: its leader, Geert Wilders, whose Islamophobic declarations are regularly given wide publicity in the press, calls Quran a "fascist book" that promotes violence, being similar to Hitler's *Mein Kampf* and, for this reason, has no place in European societies.[38]

The perception of Muslims – and Islam – deteriorated noticeably in the first decade of the 2000s among the indigenous European population. According to a report of Bertelsmann Stiftung created at the beginning of 2015 – the population of Muslim minorities living in Germany was about 4 million at the time –, 57% of the Germans consider Islam a serious threat (in 2012, this figure was only 53%), 61% believe that Islam is irreconcilable with Western culture (only 52% in 2012), 40% feel "alienated in their own country" due to the presence of Muslims, and every fourth of the interviewed persons would ban Muslim immigration into Germany (Bertelsmann, 2015).[39]

This extremely negative image of Islam, which is marred by jihadism, presents a serious barrier for the Muslim minority in Germany, contributing to their isolation and marginalization, even though the majority of them have the intention to integrate into the society. 90% of them seek the company of non-Muslims in their free time, 50% of them maintain contact with at least as many people outside their religious communities as Muslims. It is only 8% that only mingle with Muslims. According to this report, parallel societies do not exist. The summary of the report starts with the following statement: "In both their attitudes and ways of life, Muslims living in our country adhere strongly to the values of the Federal Republic of Germany. However, the majority of the population barely perceive this fact. They increasingly reject Islam. As a result, Muslims living in the country face isolation and serious stress."

The study found that even though the great majority – 85% – of the Germans consider themselves extremely tolerant towards other religions, Islam is an exception, and Islamophobia began to acquire a "socially acceptable" status. These findings seem to be backed by the rising support for the Alternative for Germany party that was founded in 2013 and included in its program a declaration that Islam does not belong in Germany and it should be expelled (AfD, 2016). According a survey published by Pew in July 2016, the negative

[38] A brief abstract from an essay dated 7 July 2016, posted on Geert Wilder's homepage, which described Islam as a "serious threat": "The wisdom of the people commands us to do something about the threat of Islam. […] Islam does not belong in Europe. We must stop all immigration from Islamic countries and start de-Islamising. […] We must treat Islam the same way we treat other totalitarian ideologies, such as Communism and Nazism. Perhaps we should even consider outlawing Islam. […] Islam is an existential threat to Western civilization." (Wilders, 2016).

[39] Spiegel Online published an article about the report under the title *Muslims are integrated, Germans are segregated* (Spiegel, 2015).

image of Muslims deteriorated significantly in a single year: by 12% in Greece, 9% in the United Kingdom, 8% in Spain and Italy, 5% in France and Germany (Pew, 2016).[40]

Mutual threats, bilateral radicalization

One of the characteristics of the Western societies is the perception of mutual threats to identities. Majority societies perceive the "alien" Islamic culture and Muslim minorities as a threat to their national identities while Muslim communities feel that their own religious identities are being threatened. At the same time we are witnessing the process of radicalization on both sides: first, radicalization among the second and third-generation Muslims and second, the rising xenophobia and Islamophobia (Muslimophobia) among the indigenous population. The two processes amplify each other.

Anti-Muslimism often manifests itself in atrocities committed against Muslim minorities living in Europe. Statistics from the Scotland Yard show that the number of hate crimes against Muslims doubled in the period between June 2014 and June 2015 in the British capital alone (rising to 800 from 406) (Ramgobin, 2015). Following the terror attack against the offices of Charlie Hebdo in France, in a single month there were 153 Islamophobic attacks, which represents a 70% increase compared to the same period in the previous year *(Les actes islamophobes…).*[41] According to an analysis completed by the German Federal Criminal Police Office *(Bundeskriminalamt, BKA)* refugees do not commit more crimes than Germans or other groups of the society (BKA, 2016b). A report published by BKA in August 2016, 655 acts of crime were committed against institutions that attend to refugees in Germany in the first 7 months of 2016, of which 118 is categorized as violent crime (bombing, arson). 613 of the 655 incidents were committed by "right leaning perpetrators" (BKA, 2016c).[42]

Security dimensions of the refugee issue

In the Middle Eastern region, migration always played an important role, which was related, in part, to social-economic problems and, in part, to armed conflicts. There were periods when millions of migrant workers arriving from various Arab countries toiled in the oil monarchies of the Gulf, and wars (e.g. the Iran-Iraq War) caused millions to seek refuge in the neighbouring countries. The largest group is made up of Palestinian refugees: hundreds of thousands of them have been living for decades in various Arab countries, mostly close to the Palestinian territories.

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[40] According to the survey of Pew, the negative image of Muslims is the worst in Hungary: 72% of the population see Islam in a negative light.

[41] The organization of Muslims living in France, Conseil français du culte musulman (CFCM), reported a total of 764 "Islamophobic" incidents in 2014, of which 22 involved physical violence, 586 discrimination and 25 attacks against Muslim institutions, mostly mosques.

[42] In an interview in June 2016, President of BKA, Holger Münch, drew the attention to the rise of "right-wing violence" as the focus shifted towards the subject of refugees, which may lead to radicalization and the establishment of terrorist structures (BKA, 2016a).

Wars, especially those that are dragging on for a long time, always lead to an increase in the number of refugees, regardless of whether they are from Afghanistan, Pakistan, Iraq or Syria. The Syrian civil war that broke out in 2011 triggered a new wave of refugees. The number of people leaving Syria grew from year to year: the figure rose to 2.5 million in February 2014, 3.2 million by December 2014, 4 million by the end of 2015, and 4.8 million in the summer of 2016, while the number of so called *internally displaced persons* amounted to 7.6 million. Most of the refugees were accommodated in refugee camps in neighbouring countries around Syria (2.7 million in Turkey, 1.2 million in Lebanon, 700 thousand in Jordan, 250 thousand in Iraq, 150 thousand in Egypt) where they waited for the settlement of the Syrian situation so they may return to their former place of residence as soon as possible (UNHCR, 2016). The prolonged war, the almost intolerable conditions experienced in many refugee camps, and the hope of a better life caused many of the refugees to migrate towards the European Union.

Existential threats created by the war is just one of the root causes of migration. More and more experts point to other root causes that are expected to be even more persistent and may prove to be even more difficult to address than the previously mentioned issues: deteriorating economic problems, climate change, drought and desertification. One of the root causes that led to the internal migration which triggered the Syrian events was the drought caused by climate change. As shown by a number of studies, Syria and the Fertile Crescent were hit in 2006 and 2007 by the most severe drought of all times. As a result, about one and a half million Syrians abandoned their original home in the country and migrated to the suburbs of cities. This led to huge social tensions, which played a key role in the outbreak of the protests in 2011, and later in the civil war that lasted for many years (Kelley et al., 2015).

Scientific studies are being prepared regarding the correlation between climate change and the outbreak of armed conflicts, and some experts seem to find direct correlation between the drastic rise in temperature, the drought and the armed conflicts (Burke et al., 2009; O'Loughlin et al., 2014). Forecasts claim that the negative impact of climate change will force tens of millions in the coming years and decades to leave their homelands and migrate mostly from Africa to Europe.

Although the refugees do not present an existential threat to the European countries and many even consider them as an alternative solution to the increasing labour shortage and population decline, the issue of refugees has become a subject of securitization in several European countries, along with terrorism and the growing threat to the European, Christian culture and identity.

It is an undeniable fact that hundreds of thousands of migrants entering Europe represents an increasing security risk as, merely according to the law of large numbers, they may include a greater number of extremists and other persons who are willing to commit acts of terrorism. So far, however, most of the terror attacks were committed not by migrants but people who were born in Europe, spoke the given language as native speakers but failed to integrate into the society and remained rootless.

Possible solutions

Halfway through 2016 it can be stated that Europe will have to live with jihadist terrorism, at least for the time being. It is absolutely necessary to take action against terrorism and to curb migration,[43] however, these measures will not remedy the above outlined problems as a long-term solution requires addressing the root causes. This involves a complex, multi-pronged and prolonged process. First of all, taking steps to solve the crisis in the Middle East is an essential condition. Syria and Iraq should be given priority, but Afghanistan and the neighbouring countries should not be ignored either. A situation has to be created which puts an end to armed conflicts and which enables the millions of refugees to return to their homelands.

This, of course, entails immense inherent difficulties considering the fragmented character of these countries, the large number of local players involved and the disagreements as well as sectarian and other conflicts between them, and the different interests of the great powers and regional middle powers, and list could go on and on. There is a broad consensus, however, that one of the most important measures to be taken is the further containment and, eventually, the complete disbanding of the Islamic State.[44]

If it succeeds, presumably the same phenomenon will occur that we have already experienced in Afghanistan. Thousands of warriors joined the Islamic State in the past years. A report by The Soufan Group at the end of 2015 showed that many of the 27 to 31 thousand combatants arriving from 86 countries came from European countries (France: 1700, Germany: 760, Denmark: 125, The Netherlands: 220, Russia: 2400, Spain: 133, Sweden: 300, Great Britain: 760) (The Soufan Group, 2015). Many of these fighters originating from Europe have already returned to their home countries, and if the Islamic State is dismantled, even more of them would follow their example, leading to a significant increase in terrorist threats across Europe.

In Europe, too, complex measures have to be taken. Such measures include establishing a common position in regard to the settlement of the refugee issue. Laying the groundwork for facilitating the integration of immigrants, which is in part a cultural and in part an economic-social (and obviously political) issue, is an urgent task. In certain Western European countries different measures and solutions will be needed owing to their different situations (the three countries with the largest Muslim minorities, France, Germany and Great Britain, have already tried different models). The severity of the situation is clearly indicated by the fact that it is not a recent problem: although the countries involved have been aware of its significance for many decades, there are debates that have been going on for years in many countries, both among the politicians and the populace, concerning the options to move forward, and extensive expert material to analyze the situation and make proposals as to the actions to be taken have been prepared, there is no meaningful progress towards a resolution and there are even clear signs of failure.

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[43] In the summer of 2016, two Western European country that suffered the brunt of terror attacks, France and Germany, decided to take serious measure to boost the strength of their armed forces. As a result, in France there are calls to revive the national guard that was abolished 150 years ago, and in Germany, for this first time after the end of World War II, they are contemplating the deployment of the army within the country.

[44] A survey taken in the middle of 2016 inspires optimism as it shows that the Islamic State is strongly rejected by the youth of the Arab world (Arab Youth Survey, 2016).

Presenting the issue as a "war between religions" or "clash of cultures" or, in other words, depicting it as the main source of conflict between Islam and the Western civilization or Islam and Christianity is unfortunate. This is exactly what extremist jihadists try to achieve as the deepening of this fault line will cause the "indigenous" population to see the Muslims in an even more negative light, entail an increase in the number of atrocities against Muslims, and the intensification of Islamophobia, which in turn may radicalize more of the otherwise moderate Muslims who may then look to the Islamic State and the extremist jihadist ideology. The goal of the extremists is to generate hate.

The main fault line is not between Islam and the West, no between Islam and the Western civilization – without denying, of course, the differences in the values of the two civilizations –, but between radical jihadist wielding violence and terror as a weapon and the moderate "others", which also includes Muslims and non-Muslims. In the fight against jihadism, Christians and Muslims are allies. One of the main problems is mutual mistrust, which should be overcome by building trust on both sides.

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Géza Finszter

Public order – public security – legal certainty (2000–2015)

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Abstract

This paper attempts to sum up the major points of the theoretical debates that have taken place in connection with the concepts of public order, public security and legal certainty in Hungary over the past fifteen years. Order and security are values that may be threatened by crime, the ever-expanding terrorism and the wave of migration as well. However, the present author is convinced that the greatest danger lies in surrendering the values of the democratic rule of law, and depart from the path of humanizing criminal law, opened up barely 250 years ago.

Keywords: public order, public security, law enforcement averting danger by law enforcement, monopoly of legitimate physical force, human rights, restriction of fundamental rights, fundamental rights test

Introduction

Our human world is fraught with risk and peril against which one needs to find defence, yet often without having the necessary means at one's disposal and being able to forecast a significant portion of the situations posing a threat. As far as the sources of danger are concerned, however powerful nature's destructive forces may be that are beyond his control, the greatest challenge facing societies is man's ignorance and his irresponsible nature inclined to evil.

Apart from the fact that ancient cultures recognized the importance of individual and community defence, and even the state's responsibility for the security of its subjects, a cooperation between public and private security became possible only with the advent of modernization after the 17th century. In the civic state, it is for the legislation to offer patterns of action that can be utilized for protecting society and prohibiting behaviours that may have adverse effects. The complicated processes outlined above have attracted the interest of social researchers from the outset, and it appears that the concepts of *public order* and *public security* have proved to be the most suitable for linguistic presentation of these processes.

One of the decisions of the Constitutional Court discusses public security: *"The meaning of public security, its relation to public order and internal order, and the definition of the latter two terms, form the subject matter of scientific debates. It is not the Constitutional Court's duty to take a position in these debates. However, a review of the elements of the legal system relevant for this purpose also indicates that public security is a category carrying several meanings, with different types of interests and values and several tasks of a fundamentally different character underlie the expression."* [Constitutional Court decision no. 13/2001.(V. 14.) AB]. Although it is not among the duties of the Constitutional Court to conduct a scientific debate, participation in the scientific discourse is a must for all researchers dealing with the issues of security. The mission of a theory is to assist in recognising the rules regulating the phenomena it investigates with its clear concepts and its definitions that carry confirmed contents. Having clear ideas on the contents of public order and public security improves the chances of defence.

Public order and law enforcement

Walking through the stages of developing the concept of public order produces a rather contradictory picture (Finszter, 2012). The effort to seek the essence of public order as a general moral order outside the world of law "considers public order to be the sum of mostly unwritten rules the observation of which is an indispensable condition for successful coexistence within the community according to the prevailing social and ethical understanding" (Szamel, 1990: 13.). However, this approach sets a task for law enforcement as the defender of public order that is barely possible to resolve. Using administrative force to defend *moral rules* and customs is in itself unsustainable. The problem is even worse if "rather than a violation of law triggering the operation of a law enforcement body, the law enforcement body elevates something into an intangible rule" (Szamel, 1990).

A recognized authority in Hungarian legal literature, among the first to conduct scientific research into police organization, Győző Concha, describes public order as a peculiar conglomerate of legal and other social standards when stating a position that public order is "collaboration between people for a common goal within the boundaries of law and nature" (Concha, 1905: 307–308.). This can lead us to the concept of public order deduced from legal order, which should no longer be in contradiction with the principle of law enforcement proceedings being governed by law, thus eliminating both the risk of making a moral approach exclusive using administrative force and preventing law enforcement authorities from establishing ethical rules.

The legal concept of order relies on the feature that the conditions for the harmonic operation of individuals and their communities can be learned about and followed by man, and such conditions can even be created by way of regulating behaviours by legal rules, and the values created by social cooperation can be protected by prohibitions set in law. However, legal means are not suitable for reaching all social goals, which is why legal order is merely a part of social order that can be regulated by state standards and can be enforced by the state's imperium.

Private law order, forming part of the *legal order,* focuses on the protection of the person and the orderly nature of the civil sector, the economy and market conditions; the

other part is *public law order,* the subject matter of which consists of the regulated relationships between the individual and the community, the state and its citizens. The order established by public law is *public order* (Kántás, 1997a: 50.). Both private law order and public law order are implemented via the voluntary compliance of citizens, but neither of them can do without protection against infringing behaviour. In civil law, the concepts of property being inviolable, the right of the parties to dispose over their things, the freedom to contract, the protection of possession and, ultimately, the enforcement of civil law claims before the court all serve this purpose.

The concept of *law enforcement* differs from this, and means the protection of public order by instruments of public law from human behaviours deemed to be violations under public law (Szamel, 1992: 11.). For law enforcement, public order is the subject matter of protection that the police shall defend, on the one hand, and the form of that protection that the police (each member of the police forces proceeding) shall observe, on the other hand. (Public order cannot be protected by violating the standards that belong to public order.)

Law enforcement tasks may be defined in two fields of public law: administrative tasks may be specified by administrative law; whereas regulating the tasks of the persecution of crime is the competence of procedural and substantial criminal law. In all cases where public security suffers an attack not yet overcome, law enforcement needs to harness the attacker on the grounds of an authorization stemming from law. Such action by authorities is called *material law enforcement activity,*[1] whose procedures cannot be forced into a framework of legislation. So, we have reached the formula of the general authorization granted to law enforcement, a general authorization *(general clause),* according to which the police shall make every effort required for protecting public security. (Note that this is a general power reminiscent of a police state, but while a general authorization is the main rule in a police state, it is an exceptional possibility under the rule of law.)

There is a conflict between the legal order of law enforcement and the freedom to take action. The *rule of law approach* finds a way to resolve this conflict by stating that rather than being simply the protector of public order, law enforcement itself is also subject to the standards set out in public order. The need for law enforcement to act on the grounds of a general authorization arises only in extremely rare situations. Some believe no general authorization is permissible for law enforcement under the rule of law, given that there is no need for such an authorization on the one hand, and that any implementation of it, however narrow, would give way to authoritarianism. We believe that the deployment of legitimate physical force in countering a threat is the manifestation of law enforcement autonomy, which is valid only at a time of averting an extreme danger but is absolutely necessary in such times. However, it cannot be considered to be action beyond law, because its sole source is the authorization granted by law, and there is a measure for its legitimacy: *necessity and proportionality.*

Averting dangers in itself is not sufficient for describing the social purpose of law enforcement. On the one hand, law enforcement has duties that cannot be considered to be the averting of danger; they are administrative services due to citizens and binding on law enforcement. On the other hand, non-law enforcement authorities also hold certain competences that give legal answers to threats arising out of unlawful conduct as well. Think

[1] "Magyary Zoltán" Administration Development Programme: http://magyaryprogram.kormany.hu/.

about the activities of the public prosecutor and the criminal judge (Kántás, 1997b: 54.). In another context, the author just cited, Péter Kántás, identifies the point of law enforcement in "emergency care", and as the most efficient means of providing this "care" is legitimate force, he considers law enforcement to be "negative public administration" the purpose of which is to protect existing values rather than the generation of new values.

In his paper cited above, Lajos Szamel upholds his doubts when he finds that public order also includes public security. Attributing contents beyond legal order to public order gives no guidance as to which pieces of legislation and life situations regulated by legislation may be included under this concept. István Tauber contests the above views. The closing sentence of his paper contains the opinion of the authors: "The subject matter of law enforcement consists of public security and public order" (Tauber, 2002: 146.).

The previous Constitution amended in 1989 did not contain the concept of public order in the definition of police tasks right until 2007, and applied the term domestic order instead. The text in effect after 1 January 2008 was as follows: "The fundamental duty of the police is to protect public safety, public order and the order of the state border" [Article 40/A(2) of the former Constitution]. Reference to domestic order disappeared, in order to be replaced with the traditional concept of public order. In this regard, it is worthwhile to cite a textbook argument from 2004: *"In any case, the following should be taken as the basis for approaching the concept and contents of public order: legislators do not use the category of public order when determining the duties of the constitution or the fundamental legislation of the police, treated as the utmost body of law enforcement. It follows from this that the subject matter of law is public security instead of public order, that is, the law of law enforcement does not operate with public order"* (Ficzere–Forgács, 2004: 402.).

Once the above chain of deduction is accepted, as of 1 January 2008, public order may be said to have become the *legal subject* of enforcement administration. This was confirmed by the Fundamental Law in force today, when it identified the duty of the police as the protection of public order, among others. The jurisprudential concept of public order continues to be the subject of debate in legal literature. From the point of view of rule of law, these debates become significant due to the fact that, provided that the broader concept of public order is accepted (including moral order in addition to legal order), this represents a much broader mandate for law enforcement administration than the approach that public order includes only the order regulated by public law. This latter approach does not contest the significance of moral standards because it requires statutory law to defend moral values as well, and considers it the "gold standard" of the legal norm.

As could be seen above, public order is a key concept of law enforcement, but public order is not deemed to include public security, as the latter has its own meaning. This is what will be scrutinized next.

Public security

Public security as the subject of law is the aggregate of values to be defended, defined as a goal for the state by democratic rule of law states. The state is obliged to operate state institutions with the social purpose of protecting public security. In 1990, the largest Hungarian law enforcement organization, the police, was analyzed by renowned international police

experts. One of their first reports had this to say about public security: public security is the part of the non-tangible type infrastructure required for individuals and their communities to implement their goals valuable for society.

Protecting public security is a task that requires investment, just as road construction is a very costly enterprise, to quote another example. However, the formula cited carries another recognition: public security makes sense only if it supports value-added work that carries risks, demands personal bravery and autonomy, and assumes responsibilities. The creative activity presupposes individual and community rights of freedom. A security that can be achieved by annihilating human rights is worth nothing because this situation destroys the creative force of society. "Observing freedom is the main aspiration for everyone in the future Europe. Security is but a means for maintaining freedom, which has to remain within the framework of rule of law, the European and international human rights obligations. It is this relationship between freedom and security that needs to govern the European Union's policies" (Tóth, 2007: 87.).

Law enforcement's *monopoly of force* is suitable only for defending values already created, and no new values can be generated by repression. This is why a solid public security was unable to prevent the collapse of authoritarian regimes. The essence of law enforcement may be summed up in a single phrase, which is none other than defending *public security.* The concept of public security should correctly be interpreted in a more differentiated manner, which is why the distinction between *normative* and *material* concepts should be made.

The normative concept of public security in the European system of values

Public security as a subject to be regulated by constitutional law is a state goal, realization of which is a responsibility primarily for the government.[2] Article 46 of the Fundamental Law provides as follows:

"(1) The core duties of the police shall be the prevention and investigation of criminal offences, and the protection of public security, public order, and the order of state borders.

(2) The police shall operate under the direction of the Government.

(3) The core duties of the national security services shall be the protection of the independence and lawful order of Hungary, and the promotion of its national security interests.

(4) The national security services shall operate under the direction of the Government."

As the subject of regulations for law enforcement administration, public security is a value to be defended, which may be protected against unlawful conduct by statutory force in the scope of so-called negative public administration. The measures taken within statutory powers are obligations including the limitation of fundamental rights, which the authority taking the measure may enforce by physical force as well in case of opposition. Therefore,

[2] Citing from the reasons of Constitutional Court decision 48/1991. (IX. 26.) AB: "Armed forces need to be organized and kept in a condition that enables them to carry out their duties with direction from the Government."

public security is a value for the protection of which there may be reason to restrict fundamental human rights.

One group of fundamental rights consists of the "parent rights" that serve to protect human life and dignity, which may be restricted only if there is a suspicion of a likely direct threat of unlawful conduct. Section 2 of Act XXXI of 1993 promulgating the Convention for the Protection of Human Rights and Fundamental Freedoms concluded in Rome in 1950 (hereinafter: European Convention) has the following to say about the possibility for restricting the right to life:

"1. Everyone's right to life shall be protected by law. No one shall be deprived of his life intentionally save in the execution of a sentence of a court following his conviction of a crime for which this penalty is provided by law.

2. Deprivation of life shall not be regarded as inflicted in contravention of this article when it results from the use of force which is no more than absolutely necessary:

a) in defence of any person from unlawful violence;

b) in order to effect a lawful arrest or to prevent the escape of a person lawfully detained;

c) in action lawfully taken for the purpose of quelling a riot or insurrection."

For the purposes of the topic, the main morals of the provisions cited is that the abstract threatening of public security does not serve as sufficient grounds for specific coercive measures entailing a deprivation of life. The types of specific threats to public security are listed in paragraphs *a)–c),* which are defined by the criminal and administrative substantial law of countries that are signatories of the European Convention, and the method for eliminating the threat are defined by the rules of criminal and administrative procedure.

Section 3, which defends human dignity, includes the prohibition of torture: "No one shall be subjected to torture or to inhuman or degrading treatment or punishment." In this case, no exception to protection is tolerated, neither an abstract nor a specific and direct threat to public security offers any release from the prohibition.[3] Section 4 on the prohibition of slavery and forced labour also has an absolute force, as it permits merely certain identified forms of public labour but a general defence of public security does not constitute sufficient grounds for obliging someone to work. On the other hand, Section 4 recognizes "service exacted in case of an emergency or calamity threatening the life or well-being of the community". Article 5 of the European Convention on liberty and security contains the following:

"1. Everyone has the right to liberty and security of person. No one shall be deprived of his liberty save in the following cases and in accordance with a procedure prescribed by law:

a) the lawful detention of a person after conviction by a competent court;

[3] The Council of Europe's resolution on the fight against terrorism adopted in July 2002 stated that States are under the obligation to take the measures to protect everyone against terrorist acts. However, all measures taken by States to fight terrorism must respect human rights and the principle of the rule of law, while excluding any form of arbitrariness, including an absolute prohibition of forcing admissions by torture. The Council felt it necessary to emphatically remind countries that traditionally consider themselves democratic countries after a long time.

b) the lawful arrest or detention of a person for non-compliance with the lawful order of a court or in order to secure the fulfilment of any obligation prescribed by law;
c) the lawful arrest or detention of a person effected for the purpose of bringing him before the competent legal authority on reasonable suspicion of having committed an offence or when it is reasonably considered necessary to prevent his committing an offence or fleeing after having done so;
d) the detention of a minor by lawful order for the purpose of educational supervision or his lawful detention for the purpose of bringing him before the competent legal authority;
e) the lawful detention of persons for the prevention of the spreading of infectious diseases, of persons of unsound mind, alcoholics or drug addicts or vagrants;
f) the lawful arrest or detention of a person to prevent his effecting an unauthorized entry into the country or of a person against whom action is being taken with a view to deportation or extradition."

All of the reasons listed above may be associated with the protection of public security but Article 5 allows freedom to be restricted only in specific danger situations. A separate question of this Article is how to interpret the notion of security in the light of the provisions cited. At first sight, it is the security of person protected against measures of authorities that restrict the person's rights. Trade literature identifies the *vertical* effects of human rights in the relationship between the state and the person, while it investigates the *horizontal* effects of human rights in the private law relations between individuals (Halmai–Tóth, 2003: 98.).

Interpreted vertically, security is a subjective right that binds administrative authorities and the judiciary to refrain from arbitrary measures, so it is added to the category of so-called negative human rights. This notion of security should not be confused with the right to life and property due to everyone, which is threatened primarily by individual unlawful human conduct rather than by arbitrary measures of the state. Being allotted to everyone equally, it may be called the security of the public, and because the state has no means guaranteeing absolute results available to it, public security may only be defined as a goal for the state, as mentioned earlier. (Were this not so, everyone aggrieved by a criminal offence could petition public power, saying it failed to protect them.)

Article 6 of the European Convention explaining the contents of the right to fair trial allows for a number of approaches for the purposes of public security. Let us take paragraph 1 first. "In the determination of his civil rights and obligations or of any criminal charge against him, everyone is entitled to a fair and public hearing within a reasonable time by an independent and impartial tribunal established by law."

So far, we have been seeking and finding the normative notion of public security in public law. Can the violations of law occurring in the field of private law not be deemed to be factors that also degrade public security? In a sociological sense, maybe yes (the great economic crises – that can be described as the collapse of the market economy protected by civil law – had disastrous effects on public security as well), but in the legal sense, the question can only be answered by looking at whether private law and civil law in particular offers any instruments capable of protecting public security in addition to restoring order under private law. How fundamental rights may be enforced in private law relations (in so-called horizontal relations) is a different question (Halmai–Tóth, 2003: 98–102.). Civil law

sanctions are suitable primarily for reparations, but public security that was violated may be restored this way only to a highly limited extent. The substantial differences between liability under civil law and liability under criminal law caution that civil law sanctions that are to warrant the smooth functioning of modern production and the market serve the purpose of protecting public security only in a very roundabout way. It is also worth noting that purely repressive criminal sanctions in themselves are also unable to restore public security, whilst they are suitable for recovering the credibility of the order of public law that was infringed, and this in itself is no small feat.

The great strategic resolutions of community crime prevention launch movements to prevent violations of law seeing the shortcomings of these systems of sanctions, among other reasons. The search for finding the right course has another consequence as well. Certain developments imply a convergence of solutions under public law and those under private law (Vékás, 2008). In civil law, non-material damages ring up the nature of criminal sanctions that restore moral wholesomeness, while mediation and the possibility to penalize legal persons smuggle institutions that belong fundamentally to private law into criminal law. The movement with the greatest effect is the practice of restorative justice (Kerezsi, 2011). The thesis submitted for an academic doctorate on the topic finds the following:

"[...] *restorative justice is indeed different from traditional justice. The difference is indeed dominant in three respects: (1) Restorative justice looks at the perpetration of a crime on a comprehensive basis, and rather than defining it merely as an act against the law, it sees the essence of a crime in the grievance caused by the perpetrators to the aggrieved parties, the community, and possibly even to themselves. (2) In involves several actors in the handling of crime: instead of attributing a role typically only to the state and the perpetrator, it involves victims and the community in the process as well. (3) It measures the success of a procedure differently: rather than measuring success by the gravity of the punishment imposed, what it considers important is the extent to which the damage and grievance caused were restored."* (Kerezsi, 2011: 112.).

It is worthwhile adding that the public law that revived the responsibility of the state and formulated state obligations to remedy the grievance suffered by a person in addition to confiscating the aggrieved party's right to defence could not have been born without this increased role of the state. There is no doubt that this development could have opened up the way to despotism, but the understanding of democratic societies of the relative independence of law resists this. The legal notion of a criminal offence and the normative order of criminal procedures extended the rule of law to the state as well. The movements that put the humanization of the means of criminal law on their banner were able to get a foothold by relying on this legal order. A violation of law by power cannot be the response to the violation of law by a person. The penalising imperium is efficient if it keeps its moral standing. A state that violates the law gambles away this moral gold standard.

Those who talk about the weakness of democratic society ignore even the simplest facts. Criminal law in a rule of law, which in its operation is based on the rule of law, the separation of powers and the respect for human rights, has created greater security than the security achieved by absolutism and cruelty in earlier centuries. Albeit dictatorships were able to thwart formal requirements of the rule of law, the European common values, having created a criminal justice system capable of curbing in the criminalization of politics and

the degrading of law into a means of power by rediscovering human dignity, evolved as the very response to this (Finszter–Korinek, 2015).

Mediation cannot be successful without the lawful and effective operation of traditional criminal justice that relies on establishing liability for a crime in fair proceedings and applies a sanction that respects human dignity. Restoration is generous about the fact that any justice can function only if the exposure of the relevant past in a truthful manner yields results. In this field, traditional justice has the advantage because it relies on investigation as the preparatory stage, the duty of which is to enable justice to learn about the past event that is relevant for assessment under criminal law by way of evidence procedures. A further lesson is that the entire system of the guarantees of fair trial serves the purpose of preventing authorities from committing irreparable errors in exposing the past and from making decisions with a false understanding. Restorative justice can only expect to be successful if it carries out mediation in knowledge of the truth of the past. Apart from the optimistic goals of restorative justice, it can be established that justice is to protect legal certainty rather than public security. Just as civil justice cannot substitute the value-added performance of the economy, criminal justice cannot protect public security that is under attack. It has no duty to do so, either. (This is why the phrase in the Fundamental Law that separates the prevention and investigation of criminal offences from the protection of public order and public security may be considered to be appropriate. This is a wise solution, as this catalogue of tasks is indeed about different qualities.)

In addition to the above, there is one more important factor that restricts the effect of justice on public security. Public security is a *synthetic* notion, which describes the general state of the protected status of persons and communities, whereas justice is an *analytical* concept, as the dispute, the legal case that is to be decided is always a unique one. This is why Thomas Gilly, a researcher of this issue, says that the general state of public security cannot be described using legal categories. (In this paper this is called the material notion of public security, to be elaborated in detail later.) The evolution of criminal statistics is not sufficient for characterizing public security as an actual state of things. Another approach describes the public law qualification of public security with the aggregate of unlawful behaviours (that is, behaviours in violation of criminal law) perpetrated in a defined area during a given period (Gilly, 1998: 154.). This statistical approach ignores the quality requirement set for crime fighting and criminal justice by a democratic rule of law, that is, the requirement of lawfulness.

The whole range of guarantee rules characterizing criminal justice set out in paragraphs 2 and 3 of Article 6 of the Convention (presumption of innocence, right to defence, etc.) serve the purposes of lawfulness and the possibility of establishing the truth in a criminal lawsuit. The validity of guarantees in criminal procedure may not hinge on the extent of the threat to public security. (In the era of proclaiming war on terrorism, this latter statement may not be considered to be evident at all, unfortunately not even in the central states of democratic rule of law.) The point we are trying to make, therefore, is that justice in itself is not capable of protecting public security, and no conclusions on the efficiency of justice can be drawn on the state of public security.

If justice is not capable of defending public security, the statutory function capable of efficiently protecting society against unlawful attacks should be found together with the administrative body allotted to that function; they should do so by preventing attacks by

the presence of public power on the one hand, and by eliminating emergency situations that arise by deploying legitimate force on the other hand. These tasks fall in the powers of law enforcement administration. As law enforcement protects society from unlawful conduct, in addition to the penalizing sanctions, preventive interventions should be based on rules of substantial law.

According to Article 7 of the European Convention: "No one shall be held guilty of any penal offence on account of any act or omission which did not constitute a penal offence, under national or international law, at the time when it was committed. Nor shall a heavier penalty be imposed than the one that was applicable at the time the criminal offence was committed." Can it be said that the rules of *nullum crimen sine lege* and of *nulla poena sine lege* may be set as a requirement already for the deployment of legitimate force by law enforcement? This requirement is often possible to fulfil, because the vast majority of behaviours that threaten public security show objective characteristics that allow for a direct and causal conclusion that a violation of law has taken place. In other cases, however, the legal facts need to be proven in order to establish a violation of law, which may be expected only in proceedings before a court decision. On the other hand, law enforcement interventions often cannot hesitate in taking measures until the evidence procedure is concluded successfully. Dangers must be averted even if the author of the attack is doli incapax. Finally, there may be situations of threat the unlawful contents of which cannot be clarified even by evidence proceedings.

Wishing to answer the question about what types of behaviour are suitable for threatening public security, substantial law on misdemeanours and criminal offences should be mentioned first, as they can be considered to be the substantial law on law enforcement. These laws are unable to encompass all the legal facts that represent threats and need to be responded to by law enforcement measures. Therefore, the sources of specialist administrative law that protect the given field by setting out prohibitions giving rise to administrative liability by setting them out in a set of legal facts subject to sanctions also belong to the domain of substantial law on law enforcement. (Such sources of law comprise areas ranging from health care through nature conservation up to consumer protection.)

Administrative and criminal standards only provide for prohibitions threatening with administrative or criminal sanctions. Once the violation of law has occurred and the authorities become aware of it, law enforcement, which safeguards public security, plays a role in preparing for holding the perpetrator accountable. (The police may also proceed as the authority in charge of misdemeanours, in which case it is also an administrative forum that enforces accountability.) However, law enforcement also has the task of preventing violations of law, which may be fulfilled by the classic watchdog function. From this point on, this function will be referred to as *law enforcement presence.* In all cases endangering public security that cannot be set out in a hypothesis, law enforcement needs to protect community values the procedures of which cannot be squeezed into the framework offered by legislation, either.

In respect of restricting the fundamental rights to life and human dignity, it can be seen that the European Convention will not be satisfied with an abstract situation of danger, it makes the application of statutory force conditional upon the occurrence of specific legal facts identified in law. Having said that, it requires less to make statutory force lawful when restricting the right to privacy and to family life, the freedom of thought, conscience and

religion, the freedom of expressing an opinion and the freedom of assembly and association. Authorities may order a restriction of the fundamental rights listed in Articles 8 to 11 of the European Convention when "necessary in a democratic society in the interests of national security or public safety, for the prevention of disorder or crime, for the protection of health or morals or for the protection of the rights and freedoms of others." Although this phrasing indeed opens the gates wide to statutory action restricting fundamental rights, one cannot think this is about a general authorization. The limits of the freedom of expression in public law are set by the definition of libel and incitement in criminal law. The methods for exercising the freedom of assembly and of association are identified in law (the Acts on the freedom of assembly and on the freedom of association). Moreover, the Constitutional Court has specified the requirement of legal certainty for all acts in a number of its decisions. For instance, it stated that the Police Act failed to meet this constitutional requirement in a number of respects as regards the collection of information in secret that restricts respect for privacy and family life.[4]

In other cases, however, the Constitutional Court found regulations to comply with the requirement of constitutionality. There have been constitutional concerns about the collection of intelligence in Hungary earlier as well. In an earlier decision [decision 32/2013 (XI. 22.) AB], the Constitutional Court has scrutinized Section 7/E(3) of the Police Act, in connection with which the European Court of Human Rights (ECHR) has now established a violation of the Convention. The investigation focused on the question whether the fact that a certain domain for collecting information is authorized by a minister of the government, a member of the executive power that can be considered the political branch of power is compatible with Article VI of the Fundamental Law that guarantees respect for privacy and for family life as well as the right to informational self-determination.

The Constitutional Court found no conflict with the Fundamental Law. In its opinion, "the assessment of national security risks requires a political decision, and is therefore in the domain of exercising executive powers." The European Court for Human Rights did not share this view when it pointed out that the most serious concern was the lack of court control over the authorization procedure. In the opinion of the Strasbourg judges, an authorization by a minister who belongs to the executive branch of power that may be considered to be the political branch is not sufficient security against possible abuse. The

[4] *"A further requirement for ordering checks to prevent crimes is that the court shall have established one of the circumstances specified in Section 69(3) paragraphs a) through h) of the Police Act to exist in the underlying case. However, the legislator has not defined the contents of the legal notions and procedural technical terms shown as categories of crimes listed in that section of the Police Act in the interpreting provisions, and they cannot be identified with the provisions of either the Criminal Code or Act XIX of 1998 (hereinafter: Code on Criminal Procedure). Consequently, save for a few exceptions, the judiciary has no set of fixed notions defined (at least) in other legislation available to it that provides sufficiently unambiguous guidance for investigating this requirement for ordering action. The Constitutional Court summed up its findings related to the requirement of clear legal standards in its decision 10/2003 (IV. 3.) AB. According to the essence of this decision that is relevant for this case, legal standards should have clear contents that can be interpreted in a recognisable manner in the course of applying the law, and this forms part of legal certainty. If the wording of a legal standard cannot be interpreted or allows for different interpretation, this results in creating an unpredictable situation for those to whom the legal standard is addressed. In addition, wording that is too generic offers a possibility for subjective and arbitrary judiciary action."* (Constitutional Court decision 47/2003).

most certain guarantee for independence, impartial and fair procedure is external control of secret surveillance by a court.[5]

In summary, the normative concept of public security includes the state goal specified under public law the implementation of which is a task for the state, as well as the social value recognized by law, whose protection may justify certain restrictions on fundamental human rights as defined by law.

The material concept of public security

Presenting public security as a conglomerate of social relations leads us to the material concept, the public security that actually exists and can be experienced in everyday life, or the absence of which may be suffered. By its primary meaning, security is a static state free of risks and dangers. Immobility without dangers can by no means be a feature of social processes. Communities do not lead a static life anywhere; it is a dynamic activity in constant motion, which is why no value-added collective action can be envisaged that does not carry any risks.

As there is no absolute security, it is more fitting to describe security as a favourable situation that is unlikely to be changed. This approach already takes into account the threats to security, and therefore strives to keep the possibility of an adverse effect at the lowest level by imposing a whole range of statutory measures. As regards the performance of business organizations, security surfaces as a requirement in addition to quality and reliability. The security of goods and services is determined by three factors: confidentiality, inviolability and availability (Vasvári, 1997: 26–28.). As public security also means security of property, these aspects govern the measurement of public security as well.

There is another approach to security, which may be considered a dynamic notion. Everyday experience is unable to come up with a single social activity that does not carry a risk of some extent. Understanding security as a state of equilibrium, a favourable life situation when some individual or community activity is able to be implemented smoothly because the effects that support the activity are in balance with those that threaten it, is a much more realistic approach. This understanding of security can be utilized well in defining public security, as it counts with inevitable risk factors while consciously striving to obtain the greatest degree of support in order to avert threats.

A further explanation of public security is close to business activities, and is typical for all kinds of social activities based on community action, in a broader sense. The interpretation of security as a non-material type of infrastructure can be attributed to the achievements of the science of organization. Having investigated the efficient operation of organizations, the various management theories called attention to the fact that security was an indispensable requirement for implementing both individual and group goals. A set of material conditions that grows increasingly complicated – encompassing a whole range of factors from buildings through road networks to communications connections – is absolutely necessary for human activities to be successful. Similarly, security is also needed, but is often not manifested in objects (which is why trade literature calls it the non-material part

[5] www.jogiforum.hu/hirek/35308

of infrastructure), nevertheless is just as indispensable as buildings, telephones or means of transport. The infrastructure approach makes it obvious that creating public security is a costly task that requires investment. (The paper will provide information on what to invest and what is worth investing in, and how the efficiency of investing for security purposes can be measured later on.)

An additional approach to security is close to entrepreneurial conduct; in this interpretation, security is the outcome of target-oriented activities, saying that the creation of security in itself is a service, where the outcome is the continuous creation of the most favourable internal and external conditions for operation. When this service is provided by public administration, its determination by administration is emphasized: it is linked to the rules of public law, there are requirements concerning format, and there is a relationship between an authority and its client, representing a peculiar form of subordination and superiority. When the service is provided by the private sector, a security company, its contents are provided by the contract drafted within the broad framework regulated by private law, and is characterized by the freedom of form and the equal standing of equal-right partners. This form under civil law is a necessity in a market economy based on private property, when private spaces are growing at the expense of public area. Private security appears as a helper of public security (Stenning, 1999). Others, however, worry that the conversion of public security into private security may result in the proliferation of social injustice and arbitrariness (Szigeti, 2001: 153.). These fears are well-founded if public law fails to firmly set out the limits beyond which protection may only be granted by the state monopoly on force. Developed European public law resolves this task successfully. (This is why it was considered to be so important to present the legal guarantees for protecting public security in such detail.) The other source of errors is when private security fails to perform its duties with sufficient proficiency and responsibility. This is a serious problem in all transitional societies where private property and the market has barely existed or operated under considerable restrictions for a long time. Fewer people think about how understanding an office as a commercial operation and the dissemination of marketing methods in public administration can also lead to a drop in quality. A cost-sensitive public administration may lose its sensitivity to law, and chasing effectiveness may undermine lawfulness. The new type of security builds on a harmony of public and private security by virtue of which it is capable of avoiding the misleading paths listed above (Salgó, 1994).

Creating security cannot be the production of one single person or an organization dedicated to this purpose. It takes collective effort to efficiently eliminate threats, so therefore, security is also a product of cooperation. The crime prevention strategy adopted by Government resolution 1744/2013 puts it like this: "Public security is part of society's quality of life, a collective product with a value the development and preservation of which is a common cause." In the modern European understanding, public security is a collective product of society that is created as a combination of the activities of individuals and their communities, the statutory measures of government agencies, the self-defence capacities of citizens and the services offered by the business market.[6]

[6] See Parliament decision 115/2003 OGY on the national strategy for crime prevention, which is not in force any more.

The following actors are especially significant in developing the urban models for public security: municipalities, the police, security businesses and civil self-defence associations. The duty of the public security and crime prevention committees described in the Hungarian Police Act is to coordinate these roles. Typically enough, the inefficiency of coordination committees in the development of the local public security system may be blamed for the lack of community cooperation even in England and Wales, where the police operates on a municipality basis. A methodology publication of the Home Office dating back to 2003 calls for local law enforcement committees to beef up their expertise on applying public opinion polls, to continuously inquire about the population's opinion using the techniques of in-depth interviews and focus group talks, thereby accelerating local cooperation (Dalgleish et al., 2003). Interestingly enough, the inhabitants of English and Welsh towns are at least as pessimistic about cooperation with the police as the people asked in the Budapest districts in a model experiment conducted by OKRI (National Criminology Institute) (Kerezsi et al., 2003).

The local, regional, national, integrated and global dimensions of public security represent the aspect of the material concept that should be mentioned finally, while this aspect is particularly meaningful nowadays. In general, the primacy of local public security may be said to have been undisputable, because individual closed communities could be "self-sufficient" in crime, particularly in an urban setting, while successfully resisting external impacts. The strict order of medieval towns required high security. This security disappeared for good with the advent of bourgeoisie and capitalist production. However, it took a balancing of the economic and cultural differences between areas and a significant development of transport to be able to demonstrate the combined effect of regional and nationwide security factors in all settlements. Once this balancing takes place in a contiguous geographic area, it is worth regarding the area to be a single public security region. The international aspect of public security may evolve in places where the values of economy, law and morals rest on a common foundation. According to Article 61(1) of the Treaty of Lisbon: "The Union shall constitute an area of freedom, security and justice with respect for fundamental rights and the different legal systems and traditions of the Member States" (text promulgated by Act CLXVIII of 2007).

It would be very nice to have security as a subjective right, protected by a state guarantee. However, this is impossible, mostly because in addition to generating value, society regularly destroys values as well. Values are destroyed in unjust distribution situations, by bad political decisions, in the absence of tolerance and solidarity, while they are also annihilated by individual emotions. The state is fallible, makes many mistakes and is not omnipotent. Administration cannot control all human intentions. Michel Foucault called the experiment of the 19th century, attempted to set up institutions that also tried to correct the behaviours deemed to be dangerous instead of merely punishing violations of law to be *social orthopedics* (Foucault, 1998: 72.). The horrible consequences of the *"disciplinary society"* were demonstrated by the 20th century dictatorships, but such attempts may occur in the future as well in spite of the lessons.

In constitutional democracies, public security can be no more and no less than a state goal that needs to be continuously worked on, but without security becoming an enforceable subjective right that could be achieved by anyone on an absolute basis. Public security as a state goal is closely related to the protection of societal values under criminal law.

The most serious threat to the security of persons and property lies in unlawful conduct. It has been experienced for over two hundred years that criminal law under a rule of law and criminal procedures surrounded by guarantees are the most efficient weapons against the crimes committed. Criminal investigation and criminal justice may take action once public security was breached, but criminal liability can restore only the legal order but not public security. It is an important achievement of the national strategy for crime prevention that it has recognized this relationship and therefore, it does not regard criminal justice as part of the crime prevention system, although it plays an important role in maintaining legal integrity, and obviously, a legal order that is restored has a beneficial impact on public security as well.

It may also be said that the security of persons and property is a reduced category of public security, which simplifies the complicated societal relationships indicated above. There are several reasons to justify this simplification. First, because prohibitions of criminal law build on this ease of understanding (don't kill, don't steal), with great efficacy. Second, because this enables public security to be measured. Even the loosest criminal statistics are capable of this. (It can hardly be denied that the history of breaking and entering coupled with theft in Hungary over the past twenty years shows a fair picture of the restructuring of property conditions in society, just as the sudden increase in car thefts provides information on the renewal in the quality of vehicles.) However, statistics are utterly incapable of controlling the performance of criminal investigation and justice bodies. Yet politicians use these statistics exactly for that purpose, similarly to the heads of the law enforcement organization. It is the statistical evaluation of police work that poses the greatest problem. "It has long been suggested that efforts should be made to unbundle the assessment of police work from the statistical registration system. Assessment of police work still relies on the statistical indicators on the success of investigations appearing in ENYÜBS[7] today. The problem with this is that the work of individual units of the investigation authorities is assessed on the basis of data in a system generated by those units themselves... If police officers know their work is assessed on the basis of the data forms they complete, they might, wittingly or unwittingly, end up distorting the statistical figures." (Kó, 2016: 47.).

Politicians recognize they are able to gain votes by promising public security, explaining why a particular technique of argumentation has evolved which might be called the interpretation of criminal statistics for purposes of party politics. It is essentially about the powers in government interpreting the then current figures to suggest that public security has improved, while the opposition concludes, from the same set of figures, that public security has deteriorated. This does not pay off for either side in the long run. Once this becomes obvious, the desirable situation will emerge in which public security becomes the field of political consensus.

It is much easier to banish the statistical approach from professional assessments. Here, the only thing that needs to be realized is that rather than being an operation that produces security, the police is an authority watching over legal order, which is why its performance is determined by the triple requirement of lawfulness, proficiency and service, and the extent to which these requirements are met cannot be estimated by statistics. This is about quality, the quality of the rule of law, and not quantities. In constitutional democracies, the

[7] Single Criminal Statistics of the Investigation Authorities and the Prosecution Organization (ENYÜBS).

persecution of crimes has to strike a balance between lawfulness and effectiveness. The values of the rule of law cannot be protected by infringing rights.

However, there is another approach, focusing on the mass of risks which have never been encountered and which cannot be managed using traditional means.

The security policy approach

"At national, European and international level, security policy is exposed to changes that have dissolved the once strict distinction of internal and external security, state and private security, prevention and repression, and the institutions allotted to and separated from these. The distinctions to disappear first are between internal and external security, and police and military security, giving rise to an international concept of security that confirms humanitarian interventions as well. Humanitarian intervention is aimed at combating crime and securing law: it sees serious violations of human rights and crimes against humanity as factors threatening international security, and departs from the interpretation according to which the only threat to international security lies in military aggression between states" (Albrecht, 2006).

The analysis of global dangers for societies from a legal perspective is performed by Ferenc Irk (2012). The title of the introductory chapter of his monography *(The notion of globalization, cosmopolitism and risk subject to socio-economic changes, from the beginning of history to date)* implies that something has changed fundamentally in the world. Though in the course of the historical review, the author himself emphasizes that globalization and its aftermaths – risk, danger, the dissolution or surrendering of security – are natural products of human life from the advent of man to date, nevertheless, dangers started to escalate in the 20th century, resulting in redrafting the conditions of the existence of human communities, cultures, civilizations by the coming of the 21st century. The age of "world risk society" has come.

According to the author, "Globalization may be best approached along economic criteria, which is why [...] the phenomenon can be discussed and interpreted from this perspective in its purest form." The path from this idea to the interpretation of the "incredible capacity" of multinational companies "to exert pressure" on states (Irk, 2012: 24.) and the "realization of extra profits" by the finance sector in a way that perceives these formations of economy to be the causes of the crises that occur rather than the results of development is quite straight. Globalization should be discussed as "the setting of particular functional, political and value phenomena" rather than in geographic or physical terms.

At the end of this chain of deduction, Ferenc Irk quotes Ulrich Beck: *"Many believe that the changes taking place in the world are driven by the battle of civilizations.* Beck thinks this is wrong. The reality is that the boundaries of nation states are being dissolved, and this world is characterized by a competition between the different cultures for seizing and retaining power. The fact that this process is nothing but the suicide of cultures is a different kettle of fish, which is corroborated by the fact that so far, the only guarantee of retaining reign – and in our current world, of survival – is democracy" (Irk, 2012: 25–26.). Irk's next idea is of key importance: "Had prehistoric man not been sufficiently willing to assume risks and shown a sound resolve (as we understand this today), his descendants to-

day would not exist, and he would have shared the fate of species that have become extinct earlier" (Irk, 2012: 25-26.). However, this statement raises questions.

If globalization is a manifestation of the essence of humanity, and can, therefore, potentially be interpreted as the only possible alternative of the future – for humanity – the question arises when and why the turn that changed globalization – as the promise of preserving and developing the human quality – into a source of risk threatening with the destruction of human existence occurred in this organic development. If the capitalist way of production is not identified with the hunger of multinational companies and banks for profit but with the sanctity of property, the freedom of contracting and equality before the law (which are the pillars of bourgeois society), the following conclusions can be drawn. The adequate political regime for this production method (the bourgeois state) is the democratic rule of law (rule of law, principle of the division of powers, respect for human rights, parliamentarism based on political freedoms). In this case, another question arises: if capitalist production was doomed to failure, should we have to say goodbye to its political setup, democracy?

There is no doubt that the bourgeois rule of law came into existence in the framework of nation states. There is a view according to which the democratic system is inoperable below a certain magnitude and/or over a defined size of society (Dahl, 1996). Other approaches fail to confirm this completely. For instance, István Bibó talked about small circles of liberty when he referred to the fact that a few persons already can carry democratic values, even if under highly adverse conditions. On the other hand, although the institutions of the Union – which have actually grown beyond the limits of individual nation states – cannot be considered to be without fault by far (and in any case, it is only totalitarian regimes that set the demand of being without fault because the appearance of being in possession of the absolute truth needs to be maintained at all times in order to exercise unlimited power), nevertheless it is true that this community was created to conserve the values of democracy, and its performance has not been bad by far in this respect so far. The questions that arise in connection with the above are as follows (and this is where the last phrase of Beck's analysis quoted above is addressed): if a democratic structure of society requires the framework of a nation state, all changes leading to the dissolution of this structure threatens democracy itself. Can the assumption that globalization brings down the nation state framework be confirmed? Also, is the observation correct that the institutions of civil democracy, of the democratic rule of law can only be operated effectively in the framework of nation states?

The trends seen nowadays indicate the contrary: on the one hand, successful globalization is the path to the survival of the nation state; on the other hand, politics pursuing a nation state that opposes global processes is often coupled with strong restrictions on the operation of democratic institutions. That is, on the one hand, the efforts to protect the nation state framework out of concern for its existence do not guarantee the conservation of democratic values; and on the other hand, successful globalization in fact defends democracy. (Both Nazism and Communism relied on national chauvinism in creating the totalitarian regime, whereas the Allied Powers acting against Hitler's Third Reich were able to defend freedom with a solidarity pointing beyond their own respective national interests, by way of what one might call global action.)

Putting the community values that determine the nation before the values inherent in persons in itself is a democratic deficit. The fundament of civil parliamentarianism is the dignity of the individual person. There is no human dignity without liberty. If, however,

the economic setup leads to the impoverishment of a part of the people (asymmetry in consumption), liberty loses its attraction and a situation occurs when democracy offers a possibility for the majority to vote for dictatorship because they believe it is the sole guarantee of security. Irk finds: "All these freedoms are important, to be esteemed and appreciated, it is just that a significant part of people are not interested in them because they have no way of exercising them, which is why they are nothing but stupid demagogy if used as an argument" (Irk, 2012: 34.).

In fact, stupid demagogy is not the use of freedoms as an argument but the political manipulation wanting people to believe that freedoms are the cause of problems and security may be guaranteed only by withdrawing freedoms. It is true, however, that the greater social inequalities are, the more efficient this kind of propaganda is; so much so that the latest formations of state authoritarianism can be created even with society's support by relying on this propaganda. Therefore, a power striving to become the sole power is interested in increasing rather than reducing inequalities.

Have we set out on the right path by replacing Socialism with Capitalism? János Kornai warns that answering this question is an inevitable obligation. He convincingly confirms that dynamism and innovation are specific features of the Capitalist economy and are virtues to be recognized (Kornai, 2011: 29.). I note that once this is understood, we will not consider the problems of world economy, Europe and Hungary as the consequences of a conspiracy by international large capital, but will look at where the requirements of the market economy and the civil rule of law were harmed.

Is it possible to resolve the contradictions inherent in the Capitalist method of production in the framework of civil society, or can results be expected only from setting up new power mechanisms? Historical experience shows that so far, all attempts at bringing down the civil rule of law have failed miserably, and to the contrary: all attempts relying on the forces of democratic society yielded considerable results, although the fundamental contradiction has not been completely eradicated. (As Irk points out, China's example shows that it operates its Communist state subordinated to the rules of the market economy, which is ultimately a concession to liberty, compared to the earlier situation in which it considered the system of absolute authoritarianism to be applicable to economic life as well, which nearly led to the total destruction of the economy.)

The enumeration of danger sources brings us to crime and its extreme forms, most of all terrorism, by necessity. The author makes a definitive statement: "Many consider the novel phenomena in the crime of the second half of the 20th century, namely acts of terrorism and hostage-taking to be a new form of appearance of the advocacy of interests. This view appears to be mistaken because – at least as far as the essence of their contents is concerned – these acts of violence stem from much earlier times" (Irk, 2012: 36.).

This statement has consequences. If crime essentially shows no features different from what it was like centuries ago, this has at least two consequences: one is that the processes that have been taking place for nearly two and a half centuries and may be referred to as the humanization of the persecution of crime and criminal justice can be explained by a shift in the values of the penalising power, rather than by the taming of crime. Cruelty by power can be no response to cruelty; the unscrupulous nature of the criminal gives no licence to the unlimited exercising of power; fear from power cannot be the remedy to the fear from crime; the key to the efficiency of justice is finding out the truth and not the extent of fear

its procedures and sanctions can provoke. The principle of the rule of law (the rules of *nullum crimen sine lege* and *nulla poena sine lege*), the system of procedural guarantees (the requirement of fair trial), the independence of justice and the humane nature of the penitentiary system could be built on these ideas.

The other conclusion is that the emergence of new forms of crime indeed calls for new criminal law solutions, but this renewal cannot mean surrendering the cardinal ideas of humanity. The criminal law of the democratic rule of law is characterized by failure to adopt the logics and methodology of crime. No level of dangers of threats can be envisaged that would justify surrendering the values of the rule of law, because in that case, the authoritarian state itself would represent the greatest danger and threat. The criminal law of the rule of law has not become obsolete, yet it is no doubt extremely unfavourable for ambitions that will not tolerate restriction on powers and claim to possess knowledge which no other political alternative has access to.

The picture of a risk society is frightening. For the purposes of the topic, the doubt arises whether public security can be sustained at all as a category suitable for describing the existing processes of society. This doubt can be detected in some of the Government documents of the past years. Even though the theorists and practitioners of law enforcement have been calling for the drafting of a strategy on public security, the central administration was more willing to accept a general vision of threats. Its result was the Government decision 2073/2004 (IV. 15.) Korm. on the national security strategy of the Republic of Hungary, replaced by Government decision 1035/2012 (II. 21.) Korm. on the Hungary National Security Strategy. Government decision 1009/2009 (I. 30.) Korm. on the National Military Strategy of the Republic of Hungary is associated with this.

Complex security

The dangers that threaten complex security, yet which are of different qualities – international terrorism, the dissemination of weapons of mass destruction and their carriers, instability within states, the challenges of the crises rooted in civilization appearing in various regions, illegal and mass migration – are effects reinforcing each other, so that disaster management services need to be on the alert constantly to manage them. Centralized civic defence and the integrated nationwide direction of fire brigades allotted to local autonomous units are not typical in the Union's regions, but several European countries have shown examples for the most efficient use of these forces in a coordinated manner in the course of preparing for emergency situations can be implemented by combining standby duty services and via single systems of operation control.

The complex approach to security and the need to immediately intervene in unexpected situations have brought traditional law enforcement administration closer to disaster management. If, however, problems that are essentially of different qualities are linked to security, "there is a firm danger that these issues take a turn towards security, that is, we will adopt the terminology and way of thinking of traditional security institutions, thereby strengthening the approach of hostility rather than of cooperation" (Renner, 2005). This warning argues against opening up the scope of law enforcement administration too wide.

The new dangers require changed techniques for managing them, which may be built on the integration of law enforcement, military and civil counterstrike capacities.

It is reasonable to separate the fields of averting dangers that can be regulated by law from the fields that cannot be regulated by law, and those that should be managed by other types of standards (scientific and technological development requirements, technological requirements, professional criteria) and not legal norms (Irk, 2004a). Another possibility is to distinguish between danger sources based on the type of threat to and vulnerability of the value-adding process. Under this approach, the extent of risk can be expressed as a ratio of threat and vulnerability (Vasvári, 1997). The other approach called "reflexive modernization" monitors the process of how activities that initially carry a high risk grow increasingly safe as technology evolves. Finally, the third approach analyzes the social reception of dangers, where one progresses from community solidarity to the completely vulnerable individual forced to face threats he is unable to control (Bukovics–Kiss, 2004).

Modern times achieve their most significant successes by developing entire systems of technical defence mechanisms. This way, the factors that initially enhanced risks may contribute to creating the means of defence. Political advertising plays a great role in facing dangers. Governments present activities within their own sphere of responsibility as low-risk, while attributing high risks to certain external factors for which they cannot be held accountable (Peretti-Watel,1999). Security is a need of society as well as of the individual. The danger can only be a threat challenging the values of society. However, the source of the danger can be purely natural, which initiates causal processes leading to losses without human intervention. The natural environment free of human intervention may be rendered safer only by learning more about it and forecasting natural processes.

The other large group of natural dangers is generated in the interaction between nature and society, which is why these risks may be substantially reduced by conserving the natural environment, an environmentally conscious behaviour, and based on the principle that the condition of nature bears no further deterioration. All states, institutions and people are obliged to observe this. Conserving nature in its current condition is a human right, an important condition for a viable life. Constitutional Court decision 28/1994 (V. 20.) finds: "The right to the environment elevates the guarantees for performing the state's obligations concerning environmental protection to the level of fundamental rights, including the conditions for no restrictions on the level of protection achieved in conserving the environment" (Bándi, 2005). The dangers flowing from metabolic processes between nature and society require the activities of natural sciences and engineering forces, as well as the development of the statutory restriction and sanction institutions of environmental administration available under public law.

The introduction of the notion of security is a sensible abstraction for government strategy purposes, but is too broad a generalization for identifying the day-to-day actions of public administration. This is an effort that strives to list all risk factors but fails to clarify that these risks show fundamentally different qualities that include positive and negative, social and natural phenomena, and phenomena that can be influenced by public law and those that cannot be managed by law. The decisions on national security are vague about the fact that in constitutional democracies, law enforcement fulfills statutory administrative and criminal investigation functions, where the rule of law should be enforced in full. This approach also contributes to the *inflation of strategies*. This phenomenon is understood to

mean that while high-standard scientific discourses appear in the form of various documents of the Parliament and the Government – which are, however, less suitable for state governance purposes – (such as security and defence policy, drugs policy, crime prevention strategy, national security strategy), the specialist branches of administration receive a decreasing amount of help for elaborating the practical actions that correspond to their particular requirements.

A similarly homogenising approach considers the distinction between public and private law to be obsolete. Although the dividing line between the two fields is indeed mobile, this in itself calls for emphasising the differences, rather than minimising them. (The importance of this can be understood when comparing the means of defence available to public security and private security.) Public security is no obsolete notion. It clearly distinguishes between venues of private and public life. It maintains the differences between the regulatory solutions of public and private law, assumes responsibility for individuals while not removing the possibility for individual self-defence, takes into account the dangers threatening public security, and identifies the unlawful behaviours against which public power may use repressive means. Developed economy, environmental protection, social security, health care, culture and education cannot be developed by way of law enforcement. Public security starts to make sense because its protection by statutory means helps the smooth running of the systems capable of generating these values.

Public security fits into the measurable domain of social phenomena. The objective state of the security of persons and property is reflected by criminal statistics, particularly when the evaluation of data takes into account the legal solutions that influence the development of statistics.

"The number of registered criminal offences showed a great drop of 20% compared to the figures of 2012 already in respect of the year 2013, and was the lowest in the past two decades. This could be explained primarily by changes in legislation, which influenced statistical enumeration and through that, the number of criminal offences that were registered. The impact of legal factors on statistics can be perceived mostly in the significant decline in the number of abuses of official documents. The reason underlying this is the amendment to Section 277(1) of the old Criminal Code effective as of 1 February 2013 (adopted also by the new Criminal Code) the essence of which is that under the earlier system, the number of instances a crime was committed was based on the number of documents stolen in the course of the offence (real formal aggregation), but from that point on, one act is to be evaluated as one instance of the offence (composite crime, delictum compositum). This change is clearly reflected by statistical figures: in 2013, the number of abuses of official documents in itself dropped by 69,000 year on year. It should be noted that the impact of the change in legislation is magnified and made more conspicuous by the fact that the figure for this type of crime in 2012 was oustandingly high, so much so that nearly every fifth criminal offence registered (18 out of 100) was about this offence. In addition to the changes to the Criminal Code, the dramatic decline in the number of criminal offences registered could be attributed to the role played by the changes made to Act II of 2012 on misdemeanours concerning value limits. The number of crimes registered in 2014 was 329,575. This shows a decline of 15% compared to last year's figure, or, in absolute terms, of cca. 48,000."(Prosecutor General's Office, 2015: 5.).

The opinion on public security reports on subjective security. The latter may be measured by regular public opinion polls. Public security is a cooperative product in which the statutory services of the state are added up with the individual and collective performance of self-defence. A well-formulated public security strategy is an efficient tool for wise governance. As public security is extremely suitable for becoming a common cause shared by the most diverse political forces, the public security strategy may be one of the first products of responsible politics in which the consensus between parliamentary forces appears as an absolutely necessary condition for law enforcement modernization in the long run, encompassing several parliamentary terms.

On legal certainty

The Ministry of Justice produced a working paper entitled *The strategy for legal certainty (2007–2013)* in January 2006. One of its foundations is the Constitutional Court's understanding of legal certainty. (Pursuant to the Constitutional Court's decisions, the elements of legal certainty are in particular: the prohibition of retroactive legislation, the freedom of legislation from conflicts, the prohibition of legislation adopted for individual cases, and respect for acquired rights.)

The Constitutional Court has found already in its decision 9/1992 (I. 30.) AB that legal certainty requires not only individual norms to be unambiguous but also the predictability of the operation of legal concepts. (ABH 1992: 59, 65.). "Legal certainty requires the legislator to avoid the use of terms that are too broad or too undefined, while the wording of the law should be understandable and clear, and carry contents that make the standard possible to interpret adequately." [Constitutional Court decision 13/2001 (V. 14.) AB, ABH, 2001: 177., 201.].

In its decision 26/1992 (IV. 30.) AB, the Constitutional Court made it a theoretical point that "clear, understandable contents for legal standards that are possible to interpret adequately are a constitutional requirement for the wording of legal norms. Legal certainty – an important element of the rule of law declared in Article 2(1) of the Constitution – requires the wording of the legislation to carry sensible and clear contents that can be recognized in the course of judiciary action" (ABH, 1992: 135., 142.). "If the legal facts in a piece of legislation are too abstract and/or too generic, the provision of law can be extended or narrowed at the judiciary's discretion. Such rules offer a possibility for making subjective judiciary decisions, diverging judiciary practices and the absence of a unity of law. This prejudices legal certainty." (ABH, 1993: 607–608.). According to Constitutional Court decision 42/1997 (VII. 1.) AB, "a rule that creates legal uncertainty due to it being impossible to interpret because its effect cannot be predicted and cannot be foreseen by those to whom it is addressed may be declared to be unconstitutional" (ABH, 1997: 299., 301.).

"In earlier decisions, the Constitutional Court recognized the interest in crime prevention as a constitutional goal the securing of which does not preclude the restriction of even certain fundamental rights. However, in all instances, it emphasized that the rule of law and the system of requirements of legal certainty cannot be surrendered even in order to implement this constitutional goal, and state bodies cannot be given too broad authorizations with uncertain contents in the interest of crime prevention taken in the general and

abstract sense" [Constitutional Court decisions 20/1997 (III. 19.) AB, ABH, 1997: 85., 92: 24/1998 (VI. 9.) AB, ABH, 1998: 191., 195; 13/2001 (V. 14.) AB, ABH, 2001: 177., 199–200.; 47/2003 (X. 27.) AB, ABH, 2003: 525., 533.].

"Legal certainty expresses the situation in which individual rights are protected from others and from state authoritarianism" (Ministry of Justice, 2006: 5.).

The main fields of the strategy on legal certainty are:

- legal regulation,
- guaranteeing the enforcement of the law, the judiciary (public administration and justice).

Though it may be considered to be a commendable initiative, the legal certainty strategy of 2006 failed to live up to the hopes it attracted, as it did not improve the quality of Hungarian legislation and made no contribution to strengthening legal certainty. Yet it was correct in defining itself as a functional strategy, and its advantage was that it relied on a thorough analysis of the situation, and dared to look its own faults made in the course of legislation in the eye. Still, it failed, and the reasons for this can be summarized in three points:

1. Lack of the culture of strategic planning

It is a general statement that the methodology and practice of strategic planning has not evolved in any of the government terms from 1990 to date. Thanks to management studies and the most diverse theories of organization, there is an abundance of recommendations, but as they were formulated with focus on the features of the business sector, even the most original ideas can be adapted to the fields of legislation, justice and public administration only with great restrictions.

The legal certainty strategy is functional in the sense that fair and predictable legal regulations are needed in all sectors of state governance (business life, finances, health care, education, social security, law enforcement, etc.). Yet, however carefully a functional strategy has been prepared, it remains ineffective if sectoral strategies are missing. And these have not been born to date.

The lack of a planning culture can be explained by rejecting the operation of power in a self-restricting manner and not the lack of preparation on the part of government actors. Public and responsible planning of government work is in itself self-restriction. The basis of the strategy is a thorough assessment of the current situation, which cannot take place without assessing one's own activities with self-criticism. The absolutization of power cannot afford such a "weakness". People can be held accountable for plans from time to time, and often need adjustment. However, power without limits rejects accountability, whoever possesses the absolute truth cannot get into a situation where he needs to modify his plans.

2. Unclarified nature of the political and public power contents of governance

Legal theory, administrative law studies and politology – which is supposed to research government work as well – have barely done anything to produce clear answers on at least three questions:

- What relationships between party politics and governance are desirable in order not to create a conflict between the will of political forces on government and the principles of operation of a constitutional rule of law?

- What are the conditions that create harmony between political direction and the sectoral requirements of specialist public administration?
- How is it possible to avoid the "abuse of legislative powers", which leads to excessive production of laws, personalized legislation, the fast obsoletion of the law drafted, and the degradation of law into a tactical means (of propaganda)?

There are no clear answers to these questions, but the fact that the questions themselves are justified is proven by several scientific works (Samu, 2003). Perhaps it is a new emerging social study, the study of governance that may bring us closer to solving the problems. Tamás Sárközi writes about the transformation of the contents of governance, in the course of which "[…] state functions change, a requirement that the rule of law should also be efficient appears, which has been unknown beforehand. Today, the practice of public power is inseparably intertwined with the provision of public services, and *par excellence* political governance was supplemented to include the functions of managing public administration and the management of public institutions" (Sárközi, 2012: 13.).

What happens, however, if a successful political force takes the position that the rule of law (at least its liberal version) is not suitable for efficient operation and should therefore be replaced? Sárközi responds to this possibility in a new monography: "The rule of law is not simply a legal technique but a democratic political value. The basic criteria of the rule of law (such as legal certainty) have evolved in Europe over the past two hundred years, regardless of the fact that certain elements allow several interpretations, and that the rule of law itself is not unchanged"(Sárközi, 2014: 19.). He goes on to continue with the idea that "pursuing the rule of law to the extremes" may be a limit to efficiency, but "the limits of the rule of law must not be exceeded in the interest of efficiency and the enforcement of power" (Sárközi, 2014: 20.). As far as that is concerned, there is not even the faintest danger of the latter.

Constitutional law aspects are also worth noting. László Sólyom thinks that there has been a process of "constitutionalization of politics" in Europe. "It was in this period that constitutional courts spread throughout Europe and the legislative activities of constitutional courts have unfolded. The ghost of »court governance« that was outlined earlier turned into the reality of court legislation for the period in which the Hungarian Constitutional Court was set up. This brought about the transformation of the entire political system" (Sólyom, 2004: 10.). These ideas reflect that the settlement of the relationship between politics and law is guaranteed through the judiciary practice of constitutional courts – at least in the western part of Europe – as constitutional court decisions are capable of curbing political will in all cases where this will takes shape in the form of legislation. However, the author also pointed out that, while it carried out an outstanding "constitutional development" mission, the Hungarian Constitutional Court made very little contribution to developing a coexistence of law and politics that complies with the requirements of the rule of law.

"The Constitutional Court failed to take into account the mediating powers that are very real parts of the political system with sufficient weight. The Constitutional Court interpreted even the inevitable mediating powers, the political parties, locked into legislation. It found that what makes a party a party is the effort to get into Parliament, it recognized a separate legal status for parliamentary parties, etc. However, it failed to adopt judgments on a really theoretical basis that would have explained what the phrase set out in

the Constitution means according to which parties cannot exercise public power, although they are obviously masters of public power in Parliament and when they get into government. That is, the interpretation of »direct« exercising of power is missing, which would be the filter to transform party power into state power" (Sólyom, 2004: 17.). We note that the problem exposed here still survives, although the Fundamental Law added a clarification by stating "political parties may not exercise public power directly" [Article VIII(3) of the Fundamental Law].

Sólyom's paper is revealing because it warns about the delay characterizing the change of the political regime. We had ideals of the rule of law and the division of branches of power standing before of us that have in the meantime become tarnished even in the leading civil states that were providing the examples:

"The multitude of state goals indicates the capitulation of legislation before the tasks of the modern state, the organizational and risk evasion needs of which they have to satisfy. These needs may be resolved with specific administrative measures, more and more by involving non-government partners and less and less legal means. This way, however, processes become lost to the democratic control over legislation. In the absence of legal grounds and forms, court control cannot be exercised. Increasing portions of the political regime become impossible to interpret for the purposes of constitutions, which were not familiar with any other system than the system of clearly distinguished social and state sectors" (Sólyom, 2004: 20.).

We think the situation is even worse in Hungary because legislation was unable to defend itself against efforts that

- put social problems that cannot be managed by legal means into a legal form (see for instance the failure of the legislative package against prostitution);
- forced ideological concepts into law, which were then put back on the agenda government after government, contradicting each other (the legal policy of strictness vs. the primacy of crime prevention, etc.);
- wished to narrow the autonomy of justice by legislation (the median value when imposing penalties, the formulation of the mandatory case for preliminary arrest, crime prevention control in the Police Act, category of priority cases, etc.);
- intended to remedy organizational and operational disturbances such as shortfalls of cooperation or the loosening of office discipline by law (law on the Coordination Centre to Counter Organized Crime, reliability check, etc.);
- turn Parliament into an "office" of the executive power by adopting "omnibus legislation", a task of which should be the control of government work (Constitutional Court decision 76/B/2005. AB).[8]

[8] The Constitutional Court's decision referred to finds the following about having fixed the budget act (Budget Act) to purpose:*"The Budget Act presents the revenue and expenditure of the state, and mainly what the state intends to spend revenues on. The Budget Act addresses state agencies that the law authorizes to spend the appropriations provided to them in the budget in order to perform legal obligations or other goals permitted by law, by taking into account other (non-budgetary) legislation. This fixing to goal means that appropriations are linked to the Budget Act. Considering its purpose, nature and character, the Budget Act differs from other legislation. Legal literature often describes this difference with the notion of law taken in the material and formal sense, showing that the Budget Act is an act only in respect of the way it is adopted, while it is rather a series of individual financial decisions by its contents. This particular, special nature of the Budget*

In contrary to the above, legislative tasks for subjects that were under the rule of law were not taken into account in strategic planning. (It is difficult to carry out a police reform without reviewing the necessary legislative tasks, and the modernization of public administration is doomed to fail if the need to legislate fails to appear or is minimized.) Instead of improvisation, planning legislation might be a solution, which would enable responsible governance to carry out the preliminary impact analyses, and to wisely consider the achievements of the scientific disciplines involved and the professional experience of the sectors to be regulated. This obligation does not limit the responsibility of politics to formulate long-term goals, but then again, there would be no danger that the executive power would get immersed in technical details. Péter Szigeti warns of another kind of danger when he writes: " – under the auspices of a kind of technical proficiency – it is exactly the quality of political theories aimed at the overall process, the whole, the actions of government that go to waste" (Szigeti, 2003: 137.). The judiciary should be obliged to professionally oppose political ideas that take to flight. (An intimidated public service is hardly able to fulfill such a controlling role against aggressive political forces, although wise governance expects this support from the administrative staff.)

3. Unclarified relationship between law and the state

While we miss the scientific and professional foundations of legislation, it should also be mentioned that the enforcement of "professor's" criteria in departure from practice is at least as great a fault as that shortfall, of which there have been several examples in the course of reforming the criminal procedure. Forcing a normative reform without organizational and operational reforms is a phenomenon that is related to this. The creation of substantial and procedural law codes comprising the objectives of modernization may be considered to be the normative reform, whereas organizational and operational reform means the harmonization of the structure and operation of government agencies with codified law, the duty of which is to enforce effective law. The new spirit of legislation is doomed to fail without organizational reforms, a consequence of which is the "counter-revolution of the rule of law". The situation in which the judiciary proves it is capable of preventing the enforcement of certain new legislation might be called the counter-revolution of the rule of law. (According to a view often voiced in connection with the code on criminal procedure, "whatever the new code says, we will just do as we have been doing so far".) There is hardly any more serious symptom to indicate a waver of legal certainty. Its consequence will be – as seen in the case of the code on criminal procedure – that codified law will slowly give up on its modernization ideas and adapt to the expectations of the conservative organization. This mutation will then lead to the extremely fast depreciation of the law. (All signs indicate that Act XIX of 1998 on the code for criminal procedure effective from 2003 is not expected to remain in force for fifteen years.)

On the other hand, examples cited from the range of instruments for regulating public law organizations are examples where implementation is impeded by disturbances of the "genre" rather than the lack of strategic thinking. For instance, the Parliament resolution containing the national strategy for crime prevention mentioned earlier was an excellent

Act excludes the possibility of the Budget Act to amend other legislation, but it is also excluded for other legislation (not on budgetary subjects) to amend the Budget Act."

scientific dissertation, whereas the resolution – given its genre – should have specified tasks for the Parliament. If crime prevention addresses the entire society, the appropriate form should be a law and not a resolution. A similar objection can be raised against setting out the drug strategy into a Parliament resolution. The latter is also an example for a case where the Parliament follows a legislative practice that is absolutely contrary to the spirit of its own resolution.

There are a number of draft strategies for modernising law enforcement, but none of them provided answers to the questions raised above, until all of them went into oblivion. In this context, the question may arise as to what legal forms the sectoral and functional strategies formulated in just working papers might take in order to ensure their implementation. For example, the strategic ideas on legal certainty could have been formulated in the new law on legislation if they could take a normative form. (See Act CXXX of 2010 on legislation.)

It would be reasonable to build the future of law enforcement on a public security strategy, but we are not aware of such work. In line with the practice of other countries, there is an urgent need for drafting a law on public security, because most of the improvisations that pose a severe threat to legal certainty have taken place in this field. Such a piece of legislation could formulate the investment needs of public security, which might put an end to shortage economy. (It might also put an end to wastefulness as well, because a public security strategy elevated to the level of an act could eliminate several parallelities and the proliferation of organizations.) At this moment, the only thing that can be known is that the strategic planning efforts of earlier years were not followed by government action, and at this moment, it seems that it is the time of action without planning. At least, this is what can be deduced from the fierce legislation activities that we have been witnessing but were not part of since 2010.

It could be a nice example of responsible governance if the public security strategy – in addition to taking the form of an act – could rely on

- the true and fair presentation of the current situation,
- a vision of the more distant future based on consensus,
- the comprehending acceptance of professional criteria,
- responsibility for the entire society,
- the minimization of narrow criteria of party politics as regards its contents.

The act on the procedure for legislation and the act on public security could be a fundamental factor of wise governance in the future in general legal policy and criminal policy, which is a prerequisite for a durable law enforcement strategy that promises safety, and could open up new horizons for those who find a lifetime career in public service in law enforcement.

Law Enforcement and Changing Substantive Law

The law enforcement governed by the law stems from the processes of law humanization in the 19th century (Finszter, 2011). Changes occurred in social movements that urged for a theoretical basis of law enforcement administration and persecution of crime (criminalistics). In this process especially three factors deserve attention.

1. The first turn occurred in the *hierarchy of values,* when the dignity of individuals reached the highest position in it. In his famous book Cesare Beccaria, the founder of modern criminal theory warned, that a suspect not deprived from their human nature, can no longer be an object, only a subject of a procedure and are entitled to the right of defence (Beccaria, 1967). A criminal procedure is not a tool of vengeance, but a road to the disclosure of truth, the sanction restores the infringed judicial system, for which the inhuman nature of crime cannot be an example. "The defendant cannot be charged with more than necessary; so freedom may be lost, but not humanity" (Vuchetich, 2007: 92.).

Has protection of society weakened when the state waived raw cruelty? On the contrary. "humanity" has brought a more liveable and secure world. The characterization of the public security of the current days is full of superfluous commonplaces, which have nothing to do with reality even if many believe in them. Those who constantly talk about the increasing risks of crimes forget that, just to take an example, security in the largest cities of Europe is clearly much better these days than it was centuries ago when executions were public events and torture during interrogation was obligatory. What has society won with the humanization of the criminal law? It has won a criminal justice system, which may enforce its power on those who deserve deprivation of honesty, and in doing this it can rely on its high moral authority. It is a common achievement of civilian merits and the criminal sciences that during the period of the European democratic transformation it was possible to build such a justice system in just over two hundred years even if the progress involved diversions and painful mistakes. This moral rise forced the modernization of law enforcement and the extension of the rule of law even on statutory compulsion.

2. The second turn took place *in the world of law.* A new study of norms, dogmatism, appeared, which successfully translated the idea of "humanity" into the language of law without giving up the objectives to protect society in the meantime. The merger of justice and usefulness was the main driving force of codification in the 19th century, which functioned as the "main principle of the educated world, approved by science and legislation" (Csemegi Code, 1880: 29.). This *credo* expressed in the Hungarian Parliament more than a hundred years ago also turned out to be the source of the constitutional criminal law. By developing the concepts of unlawfulness, actual facts and guilt, the criminal substantive law provided a tool to legislators to define just criminal prohibitions serving legal certainty.

There are classic merits of legislation, one of the most impressive Hungarian examples of which was the Csemegi Code. Law must be created when a social need can only be satisfied in that manner and when the selected legal tool seems suitable for its purpose. Punishment is an *ultima ratio*, and therefore it can only be used where more lenient tools of accountability cannot be applied. Law should be created by using the rules and patterns identified by the legal science. Legislation is an art and a craft, the possession of the techniques of writing law, in the form of an understandable, clear, enforceable text that describes the consequences of any infringement. The procedural rules satisfy similar requirements and are completed with a few specificities identified by the criminal procedural law. "Recognition has limits in a criminal procedure, which follow partly from the criminal law and the procedural law but are partly independent from them" (Király, 1972: 107.).

The main impediments of recognition in a criminal procedure are as follows:

- in most cases the single, individual and trivial criminal act cannot be reconstructed from the criminal justices *(epistemological impediment);*

- the hiding nature of crime (averting responsibility is a *moral impediment,* which is an insuperable impediment especially when the overwhelming majority of society do not accept the moral approach constituting the basis of the illegal prohibition either;
- different nature of the law and epistemological truth – this means that the legal tools are not always suitable for recognising the substantive truth *(impediments stemming from legal tools).*

This latter problem is rather complex. It raises the issue of the justice of the norm and also the issue of the match between the statements about the facts of the past with reality. It is also a problem in the application of the criminal law that the statements about the past (facts) and the legal assessment (qualifications) both appear together. Tibor Király has the following warning in relation to wrong judgments: "Legal truth can contain both truth and falsity. It is a dangerous position that any mistake or falsity covered by the state or another authority is portrayed as truth, or even legal truth" (Király, 1972: 221.). The difficulties in recognition may drive criminal power into mistakes. The procedural guarantees are there to mitigate that risk.

"According to the position of the Constitutional Court, a constitutional state can only respond to any infringement of the law in a constitutional manner […] *In the interpretation of the Constitutional Court, legal certainty imposes an obligation on the state and, primarily, the legislator, to make the law and its individual fields and rules clear, unambiguous, predictable in effect and also foreseeable in the criminal law for the addressees of the norm. The prohibition of retroactive effect can also be derived directly in the criminal law from the principle of predictability and projectability, and it especially applies to the prohibition of ex post facto legal settlement and the application of analogy* […] *The procedural guarantees stem from the principles of the constitutional state and legal certainty. These are of fundamental importance in terms of the predictability of the operation of the individual institutions of law. An effective legal act can only be the result of following the rules of a formalized procedure and legal services function constitutionally only when the procedural norms are complied with* […] *Any default of the authorities designated to exercising the criminal powers or the failure of catching criminals as a risk may be charged to the state"* [11/1992. (III. 5.) CC Resolution].

3. The third turn was *the unprecedented development* of natural sciences in the 19th century, which also created the criminal sciences. Criminalistics is the criminal science that tries to provide technical and tactical tools to an investigation with which the failures of the persecution of crime may be reduced to minimum without turning a legal service into a miscarriage of justice.

When it seemed that the law built an impossible course of barriers to justice, it turned out that such mistakes were ideal to avert judicial mistakes but they did not limit the power of the state at all in using all options offered by the natural sciences in the enforcement of criminalistic needs. It is a nice example of the harmony of history that when the punitive power applied some self-restriction and gave up its tools that deemed human beings as objects, it received unexpected assistance from the workshops where our scientific knowledge about nature and human beings expanded to such an extent in quality and quantity that was unprecedented before.

Criminalistic recognition is the reconstruction of an event of the past that involves the suspicion of a crime in order to enable the justice system to decide whether the state needs to apply any punishment. There are three levels of that recognition: everyday, professional and scientific information.

In *everyday life* the evidence procedure takes place spontaneously, in an amorphous and autonomous manner because there are no pre-planned recipes, its form is not defined and there are no obligations applicable to individuals either. We also are free in what we accept on trust basis and what we have doubts about even despite obvious evidence or facts. Although the truth contained in information can be verified in practice, but not all accurate recognitions can be justified immediately, occasionally a very long period is required for it. Sometimes successful practice is based on false information and at other times the right action is the result of the lack of information and not our knowledge. However, in everyday life recognition as communication with the environment cannot be stopped; we must act even if we know very little or nothing at all about our object. (Defence against legal infringements follows a similar natural command and therefore, as the study of the historic forms of criminal procedures proves it, some justice already functioned when there were very few options to establish historic facts.)

The following level can be deemed *professional recognition,* i.e., recognition that is in line with the rules of a profession and follows a technological order. Exercising an art and craft also assumes a special responsibility. Its evolution stems from the needs of society. It is not any generally disseminated knowledge but is the privilege of a certain part of the community, i.e., those who opt for that way of studying and thereby distinguish themselves from the majority, yet also undertake to serve the community. (The investigator's knowledge as a profession began to develop late, in the 17th century, when the first law enforcement offices were established, but became a profession that could be studied only at the end of the 19th century, when criminalistics was also born.)

Scientific recognition cannot be a spontaneous activity but must be a deliberate and planned act at least in the selection of the object and the methods that match it. The detected information is justified with a carefully developed methodology. The methodology of the theory focuses not only on the external features of the researched object, but also relies a great deal of any recognized patterns, and important and durable characteristics.

The first forms of scientific police *(la police scientifique),* the police laboratories appeared at the beginning of the 20th century. They became successful because they constantly followed scientific development and tried to match it with the needs of the fight against the changing crimes. New disciplines were created, such as voice and scent identification or the assessment of narcotic drugs. Personal identification based on DNA (genetic) samples was another revolutionary development. In recent times, computer technology provided challenges for the criminal technology: the computer systems brought progress especially in criminal records and search for data. Nonetheless, the investigation of criminal cases involving computer technology also led to the birth of a new expert field, known as IT expertise.

"During the turn of the millennium, Hungary also made progress in the application of modern scientific, IT and information transmission methods (DNA database, automatic fingerprint records) […] *Some new criminal science institutes, active in a number of developed countries of the world for a number of decades (including e.g., the German Bundes Kriminalamt, the British Forensic Science Service, the US FBI Laboratory etc.) maintain*

regular contact with research and development institutions, professionally informing them of their specific requirements for basic research, performing the adaptation research required for the utilization of new results of various natural sciences and technical fields in investigation as well as the expert examinations requested by investigation agencies" (Katona, 2004: 525.).

Naturally, the question is whether the natural science tools will make procedural guarantees superfluous. On the contrary: these exact methods made the threat of mistakes obvious and that criminal justice is not omnipotent either or that it could verify the accuracy of obtained information with legal tools. Our current knowledge makes only one option feasible for enforcing the criminal needs of the state: the fair procedure. "Consequently, the right to fair procedure is absolute inasmuch as there is no situation in which anyone could be deprived of that right" (Bárd, 2007: 61.).

As seen, three social, legal and scientific events played a dominant role in rendering law enforcement administration within the powers of the law:

- the appreciation of human rights, with the non-restrictability of human dignity at the forefront;
- emergence of the criminal substantive and procedural law based on the foundation of criminal sciences;
- development of natural sciences exceeding any previous level.

The history of emergence should be looked through the interconnection between criminalistics and the specific punitive forms. This relationship suggests a large number of conflicts for any superficial observer. Documentation of the individual elements of statutory facts entails significant evidentiary issues. Certifying criminality and especially the projective, instigation as an emotional preparation of an attack against people, infringement, causing any harm, the cause and effect relationship between a conduct and the outcome, are all difficult challenges in investigation. We must not forget either that the criminal code defines the object of evidence with such care that makes the persecution of crime plannable and facilitates the application of a wide range of detection tools and methods.

Predictable substantive law granting legal certainty is a guideline for the criminal investigation apparatuses. The more it applies to a criminal act that it is permanent in space and in time, and it challenges universal basic values, the more ancient is the prohibition command, the stability of which may not be questioned even by the accelerated social changes. If legislation in fact deems criminal liability a guard stone with the necessary wisdom, even the latest criminalization needs can loosen up the solid foundation of the criminal law.

A democratic constitutional state must possess all law enforcement and criminal tools with which the constitutional fundamental values, such as freedom, order and security, can be protected against legal infringements. Determining the borderline between freedom and criminal liability is an especially difficult issue. Often these borders could not be defined by maintaining the intactness of legal certainty and justice by legislation, or law enforcement administration or the persecution of crime or justice. If we examine the degree of responsibility of the various functions of the state listed above for this gap, then the deficiencies of legislation should not be mentioned first. Regardless of how intensively the criminal law is formed, in itself it cannot produce any solution. The abstract prohibitions of the written law can only be enforced in the specificities of the judicial practice. Persecution of crime

is a preparation for justice, which may not lack the guidance of judgments. Investigations often run into uncertainties due to the frequent modifications of the criminal code, yet a consistent and high professional quality of justice could make it confident and more effective.

A detective expert is well aware that the purpose of the criminal norm is not to make evidence easier, but to prohibit the gravest conducts that impose a threat on the community. Such experts are not afraid of any legal facts that comply with the strict requirements of legal dogmatism because they recognize that their own fight against crime can be turned into a meaningful mission only through justice and legal certainty. However, such experts are very much afraid of the sudden modifications made by the government, the individual MP motions prepared in secret workshops either based on the mistake that public order could be restored with legislation or build on the concept that low legal culture encourages the public to support those who advertise rigorosity, and that is why criminal legislation should serve political propaganda.

For criminalistics, the substantive law is an indispensable and single authentic source to define the object of evidence. However, the procedural law defines the of evidence. There is a widely accepted concept according to which the procedural laws impede persecution of crime in numerous ways to protect the criminals and therefore fair and honest legislations must end that situation. The modifications of the Act on the Criminal Procedure aimed at accelerating judgments and increasing its efficiency reflect that ideology. Restriction of the right to defence, the extension of the application of coercive measures restricting freedom, the re-interpretation of the functions of the investigation judge (serving the interests of the persecution of crime rather than protecting the fundamental rights), the establishment of special procedural rules for outstanding cases and the right of the prosecutor general to appoint a court were all adopted in that spirit.

It could also be interesting to learn about the opinion of the criminalists. Do criminal experts also look at the procedural law as a circumstance impeding their work? Can persecution of crime be made more effective by loosening the guarantees? The review of the organizational laws granting an authorization for the persecution of crimes and of the procedural code can convince all citizens worrying for public security that the criminal authorities do not lack tools and instruments in the fight against crime. The power-type nature of the legal relationships in criminal proceedings means that an arsenal of coercive measures is available for the investigators. Especially the coercive measures that restrict freedom represent a restriction of rights of which it can only be stated with slight cynicism that they are not brought forward punishments and may be executed without infringing human dignity. (The arrests shown by the media, the rules of applying handcuffs established in Hungary and the use of leashes only increase our doubts.) If we also consider the options of secret information collection and secret collection of data, we can truly see that there is almost no human right which could not be restricted in order to enable the state to enforce its criminal demand against the perpetrators. In addition, the latter tools are applied in secret and therefore the exercise of the right to defence cannot even occur in that phase but the right to legal remedy can be exercised by those whose rights were infringed to any extent by the procedures indicated above only subsequently and only to a very restricted degree.

It is a feature of investigation and it applies especially to the phase prior to the order of the investigation that the relevant past is not recognised through evidence, where we intend to convince other subjects of the procedure of the accuracy of the obtained informa-

tion but by detection, when the authority persecuting the crime intends to increase its own knowledge. It is another feature of investigation that, contrary to the reconstructing nature of investigation, the available detection methods are suitable for observing the events of the present. Seemingly, it facilitates direct recognition of reality but this directness and the incomplete nature of the observed conduct may distort the legal assessment of the recognized reality. Other tools are also available in the persecution of crimes with which it is possible to intervene into processes deemed to be criminal processes without the knowledge of the perpetrators and without any clear legal guidance as to where the limits of that intervention (the trap) are or the type of criminal assessment that can be given to the actual conduct that was triggered by the secret action of the authority.

The arsenal presented above is an effective tool in defending society but it may also become the source of an erroneous practice in the persecution of crimes. Its application may also infringe fundamental human rights, which does not comply with the requirement of proportionate and necessary restriction of rights and may cause legal disadvantage that risks the moral basis of justice and could also become a tool of political arbitrariness. We know of no dictatorship that would not have downgraded criminal law into a servant of its own power objectives.

Károly Bárd, quoted above, also points out in his book that the fair procedure does not only determine the framework of the detection of truth with which erroneous judicial judgments can be avoided. "Substantive values are not legitimized by the fact that respect for them enhances the possibility of the establishment of accurate facts or that with them it may be avoided that innocent people are punished by criminal law" (Bárd, 2007: 56.). A fair procedure also contains absolute prohibitions which in a narrow sense are called as recognized procedural guarantees and are available for everyone. They are independent from their role in learning about the truth because their single mission is to warrant the intactness of the set of values of democratic societies that serve humanity. Criminalistics provides professional skills that confirms the belief in a fair procedure. It does not consider procedural guarantees as barriers but as support which prevent members of the criminal authorities from destroying values while they look for the truth, thus risking the moral basis of the punitive needs of democratic societies and their own professional credibility.

Intelligence is the main tool in the persecution of crime. Collection of data is not unlimited because the timing, the tools and the persons involved in detection and investigation are defined according to strict statutory conditions. The criminal approach is not aimed at interrupting or preventing criminal acts taking place at present and projected in the future but is aimed at detecting unlawful acts of the past, at reconstructing historic facts and at collecting evidence. All that can have only one legitimate goal: to prepare for justice. An investigation cannot be considered a fight because it is not aimed at beating the perpetrator but at enforcing the criminal law demand of the state. This fight can only be successful when it ends in victory and all means are permitted to achieve victory. The judicial service of a constitutional state cannot use any tool and no unconditional effectiveness can be demanded from it. However, history still teaches us that such fallible justice is much more suitable for creating security for free people than any arbitrariness under the disguise of security provider.

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Zoltán András Kovács – Imre Dobák

Paradigm Changes in the Hungarian National Security Institutions (1990–2016)

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Abstract

This study explains the development of the Hungarian national security structure – with emphasis on the civilian services – between 1990 and 2016 along with the major challenges and changes during this period. It highlights the establishment of a new democratic national intelligence structure, its modifications, the periodical changes and the security policy factors influencing the organizations and their tasks, as well. Although we did not intend to give a historical overview, this is the best way to understand the national intelligence community – with its numerous ties to society – as a result of the historical heritage and the legal, social and, finally, security-political framework.

Keywords: national security, Hungarian secret services, national security system

The metamorphosis of state security (1988–1995)

Numerous studies have been published that describe the changes in the history of the Hungarian secret services, primarily established to meet the challenges of the Cold War and accustomed to the atmosphere of the bipolar world order, and the road leading to "state security and national security" (Baráth, 2010). Apart from the structural changes in the various directorates, and from the organisational units under the direct command of a director general, MOI General Directorate III (State Security GD) – in a structure[1] (Urbán,

[1] The definition of the basic structure for the Hungarian secret services until the regime change can be attributed to the first Imre Nagy Government (1953), which at the time – with the dissolution of the State Protection Authority, which previously controlled the entire Hungarian secret service structure, directly under the supervision of the Rákosi party leadership – was reshuffled with the exception of Military Intelligence (Hungarian People's Army General Staff -2, HPAGS-2) reorganized under the Ministry of Defence, the state security organizations were again integrated into the Ministry of Interior. The structural model of general directorates established a decade later in 1962 essentially carried on this structure. For further details see a publication

2007) divided into intelligence, counter-intelligence, counter-"internal reactionary forces", military counter-intelligence and covert operational technology areas – continued to work unchanged from the restructuring in 1962 for almost 30 years, until January 1990 (Cseh, 1999). However, it was not only organizational structure, but also professional-methodological elements and internal operating mechanisms that defined the work of Hungarian state security organizations for decades, essentially until 1990. The so-called basic orders issued in the early 1970's created the groundwork for all this.[2]

By the end of the 1980s, the secret services with good insight both into world events and domestic politics had increasingly been overwhelmed by uncertainty which manifested itself at the lower levels of the hierarchy in seeking better positions and the destruction of documents (especially within Directorate III/III), and in pursuing different "reform ideas" at the higher (professional and political control) levels. An important driving force behind the preparation of the regulation on state security (secret service) activities and the professional-academic debates initiated within the area of interior and justice affairs was the enactment of Act XI of 1987, whose Section 5 (b), stipulated the need to regulate the limitation of personal freedoms in an Act of Parliament.[3] It is likely that never before or after this have there been so many, sometimes quite differing, concepts developed about the future of Hungarian secret services, as in 1988–1990, in an organization that apparently tried to adapt to the process of political transformation.

By the autumn of 1988, at the latest, a workshop was launched with the aim of modernising (and saving) the state security system. A team of young staff members was isolated even within the MOI so that the team members could perform their work with less control. The group operated directly under the guidance of the Secretariat of the MOI Deputy Minister for State Security. Its members studied the known Western models (organization/regulations), paying particular attention to organizations (such as the post-Franco-Spanish or South African secret services after the apartheid regime) where the political transformation resulted in a significant change in professional work (Kovács, 2011: 69). Little is known about the activities of the workgroup. It was headed by Major General József Horváth (1985–1990), Colonel Árpád Sillai, Major General Ferenc Pallagi (15 January 1990 – 14 February 1990), then Major György Szövényi, Chief of Secretariat.

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by Attila Urbán (Urbán, 2007), to whom we hereby express our gratitude for his irreplacaeable assistance in writing this article.

[2] The legal framework for the contemporary operational work was created by Law Decree No. 17 of 1974 (on state and public security) of the Presidium of the People's Republic, further by Decree No. 6000/1975 of the Council of Ministers (CoM) – as a classified legal regulation – (on tasks related to state security) and by Directive No. 1/1975 of the Vice Chairman of the CoM (on the means and methods applicable in the protection of state security). These legal regulations were later supplemented by MOI Directive No. 005/72 establishing the basic principles of network operation, and by MOI Directive No. 0010/1973 on the preliminary vetting and confidential investigative operations of the state security agencies.

[3] Following the enactment of the law, the Prosecutor General's Office repeatedly addressed the Minister of the Interior by letter, requesting the legal regulation of the order of the procedures imposing restrictions on privacy and civic rights. On 16 November, 1988, in a lecture given at an academic conference, a staff member of the prosecutor's office criticized the fact that in many cases not only the means and results of covert information gathering, but also the existence of such investigations are concealed from the prosecutor involved in the investigations (Nyíri, 2000: 9.).

At the end of the 1980's, General Directorate III was a competitive organization compared with Western European counterpart services of the era, which effectively coordinated the intelligence and counter-intelligence operations, which is rarely mentioned in the literature on the topic, mainly because of the constant presence of the "informant issue" in the public discourse after 1990. Social revulsions against the Hungarian state security services veiled the fact that of all the counterpart services of the Warsaw Pact (WP) countries – as a result of the "Carlos Case" – the Hungarian state security services held a leading position in the development of anti-terrorist capabilities (Beke–Hegyes, 2015), as well as the fact that – through the Daily Operational Intelligence Report (DOIR)[4] system, they had been operating as an intelligence-demand-driven organization since the late 1970s, and also that they were working in the socialist bloc with a state-of-the-art, centralized registration architecture that they had just begun to convert to computer systems.

Much as they tried to keep the workshop away from professional and political influences, the conflicts of interest between the directorates were already visible, and finally the concepts were essentially the two alternatives that, to date, accompany the professional debate on the structure of the national security services. One of them was construed in terms of a *uniform service* (in this centralized version, the term *National Security Office* was first published in March 1989), while the other was outlined in the form of a functionally *fragmented structure* (January 1989), with an Intelligence Office and a Counter-Intelligence Service (Baráth, 2010: 14–15.). In essence, centralization vs. decentralization and how it is implemented stands at the core of the discussions about the national security system from 1988 to 1989.

As a conceptual turning point, the Minister of the Interior submitted a proposal to the Council of Ministers on 3 July 1989 on "Issues of *state security* in the present domestic political situation". On the one hand, it proposed the reintegration of the military counter-intelligence into the Hungarian People's Army (after that the separation of the military service(s) was practically no longer in question) (Tömösváry, 2012) and the assignment of the national economy and youth protection tasks to the National Police Headquarters (HNPHQ). On the other hand, the proposal – in line with the political changes, without mentioning a specific organizational model – proposed the gradual redirection of the "Intelligence [III/I], Counter-Intelligence [III/II] and Internal Security Service [III /III] for the new concepts, tasks and directions" (Révész, 2015: 31.).

By early autumn of 1989 at the latest, as a result of the work done by a professional body independent of the working group, the drafts for the full re-regulation of state security work had also been prepared. The professional processing and analysis of these drafts has not been done to date, so, apart from the structural ideas, we still have no comprehensive knowledge

[4] The system of daily operational intelligence reports is governed by MOI Directive No. 22/1978 that regulated the information briefing for the political leadership. The DOIR was compiled by the Secretariat of the Deputy Minister for State Security on the basis of daily reports submitted by the Directorates. From January 2, 1979 to January 12, 1990, the political leadership – in addition to the MOI Information Reports – was mainly briefed from these reports focused on operational, military and external intelligence and internal intelligence, and then (also) based on these they set tasks (intelligence requests) for the services. The evolving turnaround and the change in the demand for information indicate that, while in 1985 32% of all information needs were related to domestic/internal intelligence, the percentage of intelligence coming from the domestic counter-intelligence service was 62 % in 1989 (Müller 1999, 2003).

of what modernization ideas in the field of daily operations and methods (e.g. running agents, databases, etc.) were born within the Hungarian secret service of the late 1980's.

The issue of state security was also on the agenda of the National Round Table talks. The state party did not support the opposition proposal that suggested the separation of the state security service from the police or the one that initiated the subordination of the services directly to the Council of Ministers. On the opposition side, between the various parties and within the parties, the debate was not about the need for secret service(s) in Hungary, but whether it was to be established with the preservation of the existing staff, and how, and in what system, under what political control the services should operate.[5]

At the end of 1989, it was stated within the ranks of Fidesz that the state security service should be built in the same way as the Bundesamt für Verfassungschutz (BfV) *(German Federal Constitution Protection Bureau)*, not by the executive power, but rather as an independent security organization reporting to the National Assembly. It is an interesting coincidence that at a Home Affairs Academic Conference on March 1, 1989 – which focused partly on the new responsibilities and transformation of the state security organization – even Major General Horváth, Head of Directorate III/III, argued for the necessity of a unified organization and change of name, and the designation "Constitutional Protection Office" was also included in his proposals (Baráth, 2010: 12). (In view of the intelligence work affecting the opposition, it is not excluded – but at the level of data it cannot be directly verified that ideas within the regime change parties, parallel to the study of Western patterns, also affected the workshops within the MOI General Directorate III).[6]

Finally, the National Round Table negotiations did not produce a meaningful agreement on state security, but as a result of the conciliation, a new conceptual decision was made which is in effect to date. As the opposition urged the separation of state security from the police, after the entry into force of the new constitution, the MOI Directorate III/1 (Investigation) Department of the state security service with open investigative powers was abolished on November 1, 1989. Its powers and staff were transferred to the HNP HQ Investigation Department. This has essentially thwarted the possibility for the new security service to operate as an organization, like the US Federal Bureau of Investigation (FBI), also with so-called investigative powers. This possibility, however, did not arise either from the members of the Home Affairs Working Group or from the later concepts.

From the summer of 1989, the MOI leadership had been trying to give a new direction to the state security service, not only at internal meetings but also in public, with an emphasis on changing the terminology and methodology. For example, on 4th July 1989, the daily newspaper *Népszabadság*, reporting on the national leadership meeting of the MOI, quoted István Horváth, Minister of the Interior, who made a conceptual change in state security work. He stated that the task of the service was primarily to investigate acts affecting

[5] For a detailed overview of the issue see: Révész, 2000: 420–481.

[6] It is interesting to note that during the period of the transformation and disintegration of the German Democratic Republic, the GDR also prepared state security reform plans. In one version of these, the Ministry of State Security *(Ministerium für Staatssicherheit – MfS*, or shortly *"Stasi")* would operate under the name *"Amt für Nationale Sicherheit"*, i.e. *National Security Office.* In the ideas of the Hungarian opposition at the time, the British model is essentially, though indirectly, reflected which at first served as a model for the national security structure of the democratic German state, and secondly in the emergence of new democracies in Central and Eastern Europe.

national security, and within that the protection of constitutional powers and institutions and of the economic infrastructure (Baráth, 2010: 21.).

This is the first public evidence that the state secret service had increasingly shifted to the use of the term national security instead of state security. Concepts had changed within the internal reporting system, as the evaluations of daily operational intelligence reports increasingly referred to national security risks. While the term was coined by state security (saying they now acted in the interests of the whole nation, not only of the state), it was rooted in the legal language a few months later and subsequently adopted in the National Security Act and, most recently, in the Fundamental Law. The concept of national security is the subject of professional debates to date, on the one hand due to its roots in the one-party state and due to the possibility if its broader interpretation[7], on the other. At the same time, it should be noted that, as far back as the Austro-Hungarian Empire, the term "secret service," in the institutional sense, had never appeared in the designation or regulations of the Hungarian secret services.

Although the leadership of state security was increasingly trying to "navigate" the services towards the changes, they didn't reckon with the outbreak of an internal scandal within the organization. The surveillance case, or as it was later named, the "Danube-gate"[8] defined the country's national security structure in a striking way, partly up to the present. The Danube-gate upset both the party-state's and opposition's ideas about the future of (civilian) secret services. On the one hand, it increased social and opposition revulsion against the service(s), and on the other hand narrowed room for manoeuvre of the Németh government, which quickly split up the unified structure of the services that existed until then.

Not waiting for the results of the investigation of the Military Chief Prosecutor's Office and the internal inquiry of the Ministry of the Interior, before the spring elections and the inauguration of the new government, the Council of Ministers abolished all legal norms regulating state security activity on January 21, 1990, thus the creation of an Act of Parliament on regulating the use of court authorized techniques became a matter of urgency. This is how Act X of 1990 on the Temporary Regulation on the Special Covert Means and Techniques, and Council of Ministers (CoM) Decree No. 26/1990 (II. 14.) on the Provisional Regulation of National Security Tasks were created, after whose entry into force two civilian services (Information Office – IO, National Security Office – NSO) and two military services (Military Intelligence Office – MIO, Military Security Office – MSO) started their operation.

Since the domestic political atmosphere did not allow the creation of a fully mature secret service/national security concept in January 1990, the most obvious solution was chosen when the one-time Directorates of MOI General Directorate III (State Security General Directorate), and Directorate 2 of the Defence General Staff (HPA GS Directorate 2) were reorganized or were restructured, respectively, as independent services. Directorate III/III of the MOI (responsible for countering "domestic reactionary groupings") was disbanded without a legal successor in January 1990, its tasks that were relevant even under conditions of the rule of law (e.g. constitution protection) were outsourced, its personnel were partly

[7] For the interpretation of (and debate on) the concept of national security, see: Révész, 2007; Izsa, 2009b; Kurtán, 2009.

[8] The most complete exploration of the details of the case has been published by Béla Révész (Révész, 2004; 2005a; 2005b).

retired, partly reassigned to other areas Kovács, 2011: 70). (In spite of this, the activities of the National Security and later the Constitution Protection Office were followed up by the fact that the public often considered them – mistakenly or due to a deliberate "mistake" – as the successor to Directorate III/III.)

In order to ensure the stability of the government, primarily the protection of the position of the head of government, which was reinforced by the constructive motion for a no confidence vote, the first freely elected National Assembly, by creating Act LI of 1990, placed the military service under the authority of the Minister of Defence and the Civilian Services under the authority of a designated Minister Without Portfolio. The Antall government, despite the fact that a large number of its members and the prime minister himself were once major targets of General Directorate III (Tóth, 2016, Rainer, 2008), decided that instead of calling the personnel to account collectively and making them redundant, to retain part of the personnel of state security services whose expertise could be relied on during the transformation and/or building of civilian national security organizations.

This decision by the government, in particular during the political storms of the 1990s, came under criticism by many. It should be added that the personnel of the state security services belonging to the Eastern Bloc were "thrown to the wind" in the Czech Republic only, where pre-1990 documents – including personnel files – are almost completely public. The case of the Ministry of State Security (Stasi) of the former GDR, which has often been referred to as an example, needs to be shaded. Firstly, because the files prepared by the personnel and the intelligence – that is, not by Stasi, but by the *Hauptverwaltung Aufklärung* – are still being protected from the public (Cseh, 2010), and secondly because the GDR and the Stasi ceased to exist without legal successors, and in the five provinces requesting accession to the Federal Republic of Germany, experts from the West built the constitution protection organizations.

In the foregoing we do not wish to give a full picture of the (now partly historical) process leading to the creation of civilian national security services; our aim was primarily to clarify the points of decision and the background that defined the starting point for the establishment of the four national security services in 1990 which has an impact on the institutional development of the next decades or on its limitations, for that matter. The development of state security into national security was not a planned process. The catalytic event was, ultimately, a political scandal that was paradoxically launched by one person – Police Major József Végvári, whose professional assessment shows a mixed picture – many of his peers referred to him only as a "scandal-monger" (Kovács, 2011: 67.).

The professional challenges of the first turning point in the history of the Hungarian secret service community, in the main lines can, be summarized as follows:

- *Diversification of political oversight and professional control.* Political control was divided: civilian secret services were supervised by a minister without portfolio, while military security services were supervised by the Minister of Defence. Out of the previous two services four services were created (two military and two civilian services), led by four director generals. There was a new challenge that conflicts of interest and co-ordination between the Directorates, which were periodically emerging, but which could be previously resolved at the level of Head of General Directorate or of the Ministry of Interior, had to be settled in the coordination system of the government which was occasionally burdened by sectoral disagreement.

- *Separation of the services from the internal affairs sector.* This has in part led to a gradual deterioration of co-operation with the police, particularly in the area of civil counter-intelligence. Most notably perhaps, the organized crime investigations in the 1990's, and later the inquiry into the lessons learnt from the investigation of the so-called "serial murders of Roma people" attracted the attention of the public.
- *Support for government decisions.* Until 1990, the importance of governmental decision-making – police, border protection and, last but not least, state-security information – was concentrated in one place at the organizations under the Ministry of the Interior, and therefore the ministry established a unified, government-wide information system covering all sources. It was headed by the MOI Secretary of State for State Security (in addition to compiling MOI reports, this body operated the DOIR system). The system was disrupted after 1990, and decision-makers subsequently sought information from reports that were separately prepared by the services, which were not always consistent with each other.
- *Segregated databases.* The previously unified database of intelligence (including the Uniform Computer-Based Screening System (UCSS)9 was virtually broken down into three branches (IO, NSO, MSO), and its development and operation were within the competence of the individual services. Subsequent innovations affecting the databases went along separate paths.
- *Changes in the "image of the adversary"*[10] In our view, the image of the adversary in 1990 did not change in polarity, but in its traditional interpretation it ceased to exist and was gradually replaced by the protection of the values of the Constitution of the Republic created by Act XXXI of 1989, and by the so-called government "intelligence needs" based on the practices of the national security organizations operating within the frameworks of the rule of law and in line with the Government's priorities. (The executive power identifies the main directions of information gathering by means of formulating their intelligence needs, with respect to which the tasks were periodically set by the supervising, then controlling ministers.)
- *Separation of the HR Service, Education/Training and Logistic functional areas.* In addition to the need to organize the administrative areas (legal affairs, resource management, HR policy) in the newly established services, the real challenge was to find a solution to recruitment of new personnel (selection and education/training).

[9] The utilization of the Uniform Computer-Based Screening System (UCSS) was defined in MOI Order No. 09/1974 issued by the Minister of Interior, according to which the development of the electronic system had been completed, its utilization was to commence on 1 May 1974. The database provided personal, material, facility-based, data and, above all, a possibility to search for these aspects. As a relational database, content elements were merely summarized, basically showing which of the systems, organizational units had matches for the queried facility. Up-to-date IT support for the UCSS began at the end of the 1980s, and one of its results has become known as the "magnetic tapes".

[10] The set of tasks issued by the political leadership to General Directorate III (so-called intelligence needs, but in those days this term was not in use) was concieved in the early 1980s (e.g. the MOI Order issued in 1982 on the selection and monitoring of adversarial persons posing a threat to society), and a significat part of it was still in force in 1989. Neither the political leadership nor the regulatory machinery could keep up with the acceleration of domestic and foreign political events, so the conceptual clarification of the image of the adversary was made up to 1990 in the form of oral guidelines. That is to say, all the orders that applied to the monitoring of the democratic opposition and the activities of the NATO member states were in force.

The hitherto uniform training system had ceased to exist by the dissolution of the State Security Faculty of the Police Officer Training College in the spring of 1990 and by reassigning its students to the other Faculties where they were allowed to complete their studies.

- *Changes in terminology and methods.* The basic professional methods of one of the oldest occupations in the world did not change in content, only in name. From this area to the public, in addition to the dichotomy of state security vs. national security, the term "operational" may be familiar to have replaced the term "operative" [used as an adjective – translator's note]. It is not the result of intensification of international cooperation, but the gradual emergence of Anglo-Saxon acronyms at the end of the decade. For example, before 1990, the term network, later called the contact system, and more recently the HUMINT (human intelligence), were/are used to denote human source intelligence.

In addition to the above-mentioned professional challenges, the government faced a multilateral political challenge with the national security system. In addition to (1) having to address the above-mentioned question with respect to former state security personnel (complete break vs. gradual modernization), (2) having to strike a balance between the effectiveness of secret services and democratic control, while (3) having to meet complex challenges presented by a changing world order (international terrorism, environment of the forming alliance, increasing organized crime) (Kurtán, 2009: 3.).

In this context, it was inevitable that a process of stabilization should start. Today, there is an increasing consensus that the complete transformation, that is, the dismantling of the system and its structure would have set back the preventive intelligence capabilities for years, instead, the change, in addition to the internal institutional change, had to be primarily embodied in a regulation receiving comprehensive, broad political support.

The National Security Act (1995–1998)

Hardly had the four secret services started working independently, when they began to prepare the normative text regulating the activities of the services comprehensively. The draft National Security Act, submitted by the Antall government in autumn 1991 (T/1462), had only been drafted, and Parliament had not yet put it on its agenda. Because of the differences between the parties and the social anxieties linked to the state security of the past, it was clear that the entry into force of the law could only take place through a strong political mandate.

Upon the initiative by the Horn government, which was formed in 1994 and now had a qualified majority, Act CXXV of 1995 on the National Security Services (hereinafter: National Security Act, NSA) was finally adopted by the National Assembly on 19 December 1995. The NSA detailed the rules governing the mission, legal status and principles of national security work, the rules of covert information gathering and the parliamentary control of national security activities.[11] One of the most important guiding principles of the

[11] For more on the National Security Act, see: Dezső–Hajas, 1998; Hajas, 1999.

legal regulation was to try to establish a balance between the effective functioning of the services and the control of national security activity, and the protection of rule of law and democratic fundamental values by incorporating wide-ranging safeguards against possible abuse of power.

The Act substantially confirmed the structural foundations established by the Németh government in 1990. It meant an organizational change that the Special Service for National Security (hereinafter referred to as SSNS) of the Service and Operational Technical Directorate of the National Security Office (formerly Directorate III/V) was established as an independent institution. The possibility of institutional outsourcing of technical intelligence tasks had emerged already before 1990 in debates on the transformation of the secret service institutional system. The decision was partly governed by budget policy and partly by professional considerations since the SSNS collects data for all organizations (currently nine) authorized to conduct covert information gathering, so the skills and expenditures do not appear in parallel but are concentrated.

The NSA essentially stabilized the established practice of interaction between the services and politics by retaining the position of minister without portfolio, but now with directive rather than supervisory powers, and this change of legal status had primarily administrative and regulatory reasons (Hetesy, 2011: 22.). In the spirit of breaking with the legacy of state security, the rule was that it excluded the role of those ministers who typically were in charge of the governmental control and inspection of secret services in the states of the Euro-Atlantic area. As a result, the Hungarian model was different from the superstructure of all international intelligence organizations.

Even the drafting of the law was accompanied by political debates, in the forefront of which, while the establishment of the NSSS was agreed upon, stood the reduction of the number of services (three out of five). Two models of centralization were outlined. One (enjoying support from FIDESZ in particular), the so-called *functionalist model* was construed as a coherent structure of intelligence (IO-MIO) and counterintelligence (NSO-MSO) services while the other (supported by MSZP), a *unified political direction model* urged the consolidation of the military (MIO-MSO) and the civilian secret services (IO-NSO).

Over the next decade, these two models for the Hungarian secret service community defined the policy thinking surrounding the national security institution system, and there was a consensus on reducing the number of services – both politically and (perhaps) professionally. Parliamentary debate of the NSA Bill of 1995 was eventually resolved by Parliamentary Decision No 47/1996, (VI.7.) issued by the legislative body to the Government, calling upon the Government to review the functioning of the system and, if appropriate, suggest any amendment of the law, within a year of the entry into force of the NSA. The Horn government, while in less than a year it could scarcely have been able to gain substantive experience, finally stood by the functionality of the five-service model (IZSA, 2007: 2., Balla, 2001: 14–21., Hetesy, 2011: 23., Kurtán, 2009: 3.).

Although the Act defining the Hungarian secret service institutional system for nearly 15 years can be evaluated in an international comparison as a thorough regulation, yet it preserved the existing relations, practically completing the process begun by the Németh government, which resulted in the organization of former state security directorates into independent services. It is therefore debatable that the national security law was indeed a

milestone as a whole, in the evolution of the Hungarian services that can be considered an independent era, a real paradigm shift.

The NSA comprises the political and professional experience of the "under-regulated" period until 1995 and, while addressing a number of (partial) issues, it paid close attention to the relationship between society and national security services, parliamentary control, and embedded in the long term the policy debates on the intelligence organization system as well. Due to the permanent presence of structural issues, the law has caused instability from time to time and indirectly has resulted in greater political exposure in the operation of the relevant services (mainly IO, NSO, MSO and MIO).

Complex challenges – attempts at reform (1998–2010)

During the tenure of the first Orbán government taking office in 1998, different concepts emerged behind the scenes about the future structure of the services. All these ideas were outlined at a conference organized in autumn 2000, which was attended, besides Hungarian decision-makers and specialists, by invited foreign guests.[12] In addition to the two modalities of the merger, as mentioned above, the idea of the reintegration of the civilian counterintelligence service in the Ministry of the Interior and the elimination of the ministerial post without portfolio were also raised as an alternative.

It should be added: as a result of intensifying organized crime and corruption, at the end of the decade, in professional circles (too), the question was raised more and more often whether it was right to maintain the independence of civilian counter-intelligence from the MOI from the point of view of cooperation with the police. Following the conference, there was no further substantive policy dialogue concerning the reorganization of services until 2006. From the second half of the 1990s to 2010, in an organizational structure[13] unchanged in its core elements, the law enforcement agencies and the secret services[14] faced complex challenges that, together, gradually exerted influence on the evolutionary path of the sector. The external and internal "indicators" of the era can be summarized as follows.

[12] The proceedings of the conference on National Security was published in 2001 *(On National Security. Presentations made at the conference on the National Security Structure of the Republic of Hungary and on the Tasks of the Services in Budapest, 26–27 October 2000)* and was classified for 15 years, until 31 December 2016, so we rely on Zsolt Hetesy's PhD thesis (Hetesy, 2011) with regard to what was said there.

[13] Between 2002 and 2007, the temporary cessation of the institution of a minister without portfolio brought about a change, upvaluing the role of the Political State Secretary (then András Tóth) contributing to the performance of control functions, and – from the summer of 2006 – the role of the Head of the National Security Office at the Prime Minister's Office, working together with the Minister in charge of the Prime Minister's Office, tasked with directing the services. In the summer of 2007 the Government re-established the posts of the minister without portfolio in charge of the civilian national security services (Dr. György Szilvásy) and the post of State Secretary contributing to the performance of control functions.

[14] Not wishing to go deep into the professional debate on the relationship between national security and law enforcement agencies (for a summary see Hetesy, 2011: 11–12), we for our part consider civil security services, both in line with the spirit of the Fundamental Law and the NSA and in accordance with the international professional perception, as a special sector of the law enforcement organization system.

Organized Crime

The strong presence of organized crime at the end of the decade required complex responses from the government. One element of this was the creation of an analytical, coordinating body to provide a solution to the development of police and national security cooperation and data exchange. The purpose of the Organized Crime Coordination Centre (hereinafter referred to as OCCC), established on 1 January 2001 (Act CXXVI of 2000), was exactly that. Its personnel were reassigned from cooperating agencies who, on the one hand, systematized and stored the information received from different organizations, and supported the work of the investigative agencies by analyzing them, drawing the attention of these agencies to possible duplications of efforts.[15]

In Europe, Hungary was one of the first countries where an organization was created that coordinated the law enforcement and national security service and integrated analysis of their data as a third party. The information (or by their later professional name: fusion) centres in 2003 were typically created in the Euro-Atlantic area not in the context of increasing organized crime, but in response to the spread of international terrorism. It is common for them to evaluate their creation essentially as a (policy-based) political response to a serious security challenge that has a direct impact on society, focusing on the internal coordination risks of articulate and substantially non-changeable law enforcement and intelligence structures in a given political environment.

Following the terrorist attacks of 11 September 2001, the activities of the OCCC did not change substantially. Among the compulsory data provision services, the number of offenses in the focus of analytical work only increased significantly after 2010 (partly due to the murder of Roma people in Hungary).

International terrorism

The purpose of this study is not to give a detailed description of the changes in the domestic and international security policy thinking generated by 11 September. We do not intend to engage in the controversy about how much the "intelligence services grown comfortable in bipolar thinking" were, or could have been, shocked by the fact that the hitherto pervasive image of the adversary had been replaced by a permanent risk of unprecedented dimensions in human history. All these issues, as well as the faux-pas of the secret services (e.g. Iraq, 2003) and the recurrent conflict of domestic religious radicalization (e.g. London, 2005) at the beginning of the new millennium and the recurring conflict between human rights and fundamental rights and security needs have determined to a large extent the next decade of secret services.[16]

The impact of the terrorist attacks on 11 September 2001 and later in Europe (Istanbul – 2003, Madrid – 2004, London – 2005) has partly contributed to the fact that, with significant political support/expectation, cooperation is conducted both at national and at international

[15] For the operation of the OCCC see more in: Bálint, 2012: 131–137.

[16] For the impacts of September 11, in addition to a number of studies published since then, see more in Tálas, 2002.

levels. Numerous multilateral organizations[17] have made substantial exchanges of data and experience, and the foundations of common international databases have also been created.

The recognition of the risks inherent in national information sharing has led to NATO and EU member states establishing the so-called (anti-terrorist) fusion centres, which basically have two types. One type includes newly established, permanent organizations whose main profile is integrating, analysing data affecting the security community in a given country, strengthening coordination between organizations, and screening possible duplication of efforts. The other type is made up of fusion agencies that operate in an essentially ad hoc (advisory) function, their function primarily being to cover the coordination of the actions/tasks and making professional (senior and mid-level) decisions. Of course, there are overlaps between the two types and, based on the individual practice of each country, some centres have specialized or have received specialized extra tasks (e.g. open information search, political decision support/government information) (Gill, 2010: 209–219.).

In 2003, the institution established under the name of Anti-Terrorist Coordination Committee (ATCC) was in the latter category. By 2010, its work had been coordinated by the National Security Office, since then by the Counter-Terrorism Centre (CTC), and all the police and national security organizations involved in the fight against terrorism belong to its members. As a non-permanent body, its activities were fundamentally determined by changes in the security environment, and accordingly, the ATCC later conducted discussions not only on security issues directly related to terrorism. Since the Organized Crime Coordination Centre formally had the necessary powers and capabilities, the ATCC was established in parallel with the organization's intensified involvement in the development of national co-ordination of counter-terrorism (Tarján, 2004: 45). The function of terrorism analysis came to the forefront of the centre's work ten years after the establishment of the OCCC, as a result of a new wave of terrorism, along with significant legislative changes to be demonstrated later on.

National security strategy

With the efforts related to the transformation of the institutional system of the Hungarian secret services over the past decade, the process of creating a strategy for services has been linked at several points. Government Decision of May 2002 [GD No. 2144/2002. (V.6)] based on Parliamentary Decision No. 94/1998 (XII.29.) on the Basic Principles of the Security and Defence Policy of the Republic of Hungary and then in 2004 [Government Decision No. 2073/2004. (IV.15.)] and updated in 2012 [Government Decision No. 1035/2012. (II.21.)], The National Security Strategy (hereinafter referred to as NSS) identified the government's expectations of the role of national security services alongside identifying security challenges in the country.

Although the NSS in 2004 asked the government to develop the tasks arising from the implementation of the national security strategy in a sectoral strategy, but the national

[17] As far as Hungary is concerned, of these the Counter Terrorist Group (CTG) is the most important service-management and expert platform for cooperation, created in 2001, formally outside the institutional system of the European Union, but in cooperation with it. See http://pilac.law.harvard.edu/europe-region-efforts//counter-terrorist-group-ctg

security strategy in the list was not submitted to the Government before the parliamentary elections in April 2010. In the course of the preparation of the national security sector strategy, the Government no longer appointed either responsible officials or deadlines, so its final drafting is currently waiting to be completed. Only the Ministry of the Interior made attempts at creating a national security strategy in 2012, but not in relation to the NSS, but independently of it, mainly as the medium-term concept of national security agencies under the direction of the MOI (Solti, 2014: 49–50.).

Budgetary pressure – attempt at reform

The second Gyurcsány government found itself in a difficult budgetary situation after taking office in 2006. Reform ideas driven by the need for savings reached the national security services[18] in the summer of 2006, when the government, in its Government Decree No 2118/2006 (VI.30) on organizational transformations and the underlying measures to promote the effective functioning of public finances, formulated the intention of the institutional transformation based on the "tri-service model." In order to develop detailed suggestions and possible directions, the minister in charge of intelligence services requested an expert committee (Izsa, 2009a: 51; Homonnai, 2007: 12). The reform agenda became concrete in January 2007, after the government, in Government Resolution No. 2010/2007. (I.30.), outlined the possible directions of integration that contained the already mentioned (functionalist vs. uniform governmental) models that had already been present in policy thinking essentially since 1995 while retaining the distinct position of the National Security Service.

Finally, the government did not support the consolidation based on unified control advocated by the HSP, but the functional consolidation (IO-MIO, NSO-MSO) proposed by FIDESZ *(Alliance of Young Democrats)*, and thus, despite the complex internal political environment, there was a chance to implement the reform (Hetesy, 2011: 23.). Although the process was fundamentally driven by financial considerations, the professional representatives were aware of its necessity. Almost 10 years after 2006, enough experience has accumulated in relation to the National Security Act to show the system's shortcomings. (The experiences of the national security institution system are summarized in Jenő Izsa's SWOT analysis published in 2007: Izsa 2007.)

Finally, the 2007 national security reform attempt failed not because of a lack of agreement with the opposition, but in the absence of a compromise within the MSZP, as the defense ministry did not support the functional consolidation of the services. At the hearing before the National Security Committee in June 2007, the Minister without portfolio had already informed that he considered it necessary to strengthen the OCCC in order to coordinate between organizations and asked the State Audit Office (SAO) to review the issue of merging civilian and military services (Fazekas, 2007). The report of the SAO[19]

[18] Gergely Szentgáli's statement that the 2006 concept of secret services was driven by the crowds protesting in the streets and by increased efficiency. In the background, as stated by the government in its decision, financial policy considerations were in the beginning, although it is beyond doubt that the lessons learnt from the events subsequently contributed to the transformation that was ultimately only implemented at the institutional level (Szentgáli 2015: 48).

[19] Report No. 0739 on the Financial and Economic Control of Civilian National Security Services (October 2007).

was finalized in October 2007 and the fundamentally budget-based inquiry did not raise any objections to the foreseen changes, but, while it did not hold a position on national security issues, stressed that the planned transformation would realistically bring about a return on the budget over a four-year period.

By this time, however, it had become clear that reform attempts, due to the conflicts of interest within the governing party, stalled, and ultimately only institutional changes were made. The National Security Office was reorganized with effect from 1 September 2007. According to some reports, the number of organizational units dropped by a third, while nearly twenty Heads of Division were dismissed. The question of reorganization soon came to the forefront of political debate, and several people considered the process as "cleansing" (Lencsés, 2007: 2., Szakály 2007: 17.). It is a fact that in 2008, with the usual budget allocations, NBH managed nearly HUF 2 billion more, which covered both development goals and the severance pay and benefits of the laid-off personnel.[20]

The extreme right gaining strength – serial killings of Roma people

As a result of domestic events, the extreme right-wing movements and the post-2006 emergence of organizations showing signs of paramilitary features presented reshaping challenges for the Hungarian law enforcement agencies and the civilian national security agencies. Both the society and the political leadership were shocked by the fact that the intensification of the activities of extremist organizations had led to the perpetration of terrorist acts and then serial killings.

The Arrows of the Hungarians National Liberation Army, linked to György Budaházy, entered the scene in 2007, with at least nine counts of attempted assassinations/attacks perpetrated with Molotov cocktails and explosives. Although the attacks were basically carried out for the purpose of a warning/intimidation and not linked to any demands, the Arrows of the Hungarians in several respects bore the characteristic features of terrorist organizations (Boross, 2013: 8-12). (At the time of writing this study, on 30 August 2016, the Budapest Metropolitan Court sentenced Budaházy to 13 years in prison at first instance, while his 14 accomplices received prison sentences of 5–12 years.)

While the world's security organizations focused primarily on religiously-driven, internationally-motivated terrorism, the attention of Hungarian national security forces was increasingly concentrated on mapping internal, political (terror) risks in this period. Both the public at large and the law enforcement agencies were shocked by the series of crimes that lasted for one year since the summer of 2008, which became known as the serial killings of Roma people. In a total of nine racially-motivated assassinations, six people were killed (Boross, 2013: 13–19). Early on during the investigation, the dysfunctions between the police and the civilian security services became apparent, which were not only confirmed but further specified by the subsequent investigations conducted by the competent parliamentary committee, as well as by the internal investigations of the MSO and the NSO (Rényi, 2013).

[20] In 2008, the National Security Office managed an exorbitant budget of HUF 10,107.8 billion in comparison with the previous years. In the previous year (2007), 8,846.7 billion HUF and in the following year (2009) 8,796.5 billion HUF were available for operating costs. (For more details, see Act CXXVII of 2006, CLXIX of 2007 and Act CII of 2008 on the Budget of the Republic of Hungary.)

In the case of the Arrows of the Hungarians and the serial killings of Roma people, the evolution of extreme organizations in Hungary entered a stage that had a direct impact on the activity of the civilian security organizations. The fact-finding inquiry conducted by the National Security Committee of the National Assembly on the civilian security service (NSO) identified serious malfunctions focusing on the problems of coordination within and between organizations, institutional information management and analysis, and the shortage of staff and professionals (40% on average)[21] due to the autumn restructuring of the relevant organizational units. Inquiries related to the role of the Military Security Office later found, among other things, that one of the perpetrators helped the military counterintelligence as a covert source (commonly known as "informant").[22] All in all, the circumstances, therefore, showed the failure of the Hungarian secret services responsible for counter intelligence.

The recognition that the perpetration of a crime could have been prevented if the co-operation between the police and civilian (NSO) and military counter-intelligence (MSO) had existed at an appropriate level indicated the need for fundamental change in the system. It is also a remarkable parallel that the investigation of hate crimes linked to the National Socialist Underground (NSU) in Germany[23] came to similar conclusions. In addition to revealing the failings of the German Constitution Protection Office (BfV) and establishing personal responsibility, the measures taken in Germany strengthened cooperation between BfV and the police, in particular the cooperation between the BfV and the Federal Bureau of Criminal Investigation (BKA). In a professional sense, this meant that some areas had "brought closer" the national security and criminal intelligence work done with a preventive purpose.

By the end of the first decade of the millennium, due, among other things, to the experience of the Arrows of the Hungarians and the serial crimes, there was no question for both political and professional leadership that, on the one hand, the members of the Hungarian law enforcement community, in particular the national security services work in an "island-like" manner, especially the national security services, and that in this context there are significant risks in the cooperation at national level, on the other. Due to delays and distances between the police and the national security agencies, before the elections in 2010, there was the possibility to develop the same political control of civilian security and thereby the possibility to develop internal security cooperation. The lessons of the tragic events seemed to overwrite the symbolic significance of the achievement of the regime change (20 years ago), namely that the services were separated from the police and the Ministry of the Interior was excluded from ministries exercising direction and control over the services.

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[21] Fact-Finding Inquiry Report. Evaluation of national security service work assisting the investigation into the serial murders of Roma people based on the investigative work of the Fact Finding Working Group established by the National Security Committee of the National Assembly (17 November 2009).

[22] Report. The professional activity of the MSO of the RoH in the investigation of the crimes perpetrated against Roma people.

[23] From 2000 to 2007 the NSU perpetrated (at least) ten murders (killing nine immigrants and one police officer) and two bomb attacks (killing 23 victims) in Cologne. The group maintained itself from proceeds of bank robberies, and several of its members were on the radar screen of the German security services. Nevertheless, the NSU was eliminated not as a result of intelligence/investigative efforts and police coordination, but because one of the members, after two of his comrades had committed suicide, turned himself in in 2011. The trial of the case is under way and some details are currently being clarified.

Information society (2010)

Formed on May 28, 2010, the second Orbán government, with a parliamentary majority required to amend the NSA, introduced fundamental changes in the area of government control of civilian national security services, some division of tasks between organizations were changed and the civilian national security organization was restructured. Apart from the integration of national security and police capacities into the Ministry of Interior, the divided nature of the Hungarian national security structure was further strengthened, as the tasks of the governmental control of the national security services were divided between three ministries, instead of the former two ministries.

In the current Hungarian national security system, a national security model including five services is now in operation, which by the beginning of July 2016 acquired the current framework, with the establishment of the Counter-Terrorism Information and Crime Analysis Centre (CTICAC). (The five-service model was already present in the Hungarian system between 1995 and 2011, but in two periods, between 1990–1995 and 2012–2016, respectively, the Hungarian structure embraced four services.) The political guidance of the services is still tripolar where the Government directs the Information Office through the Minister in charge of Civilian Intelligence, the Constitution Protection Office, the Special Sevice for National Security, and the Counter-Terrorism Information and Crime Analysis Center, through the Minister in charge of the civilian national security services, and the Military National Security Service through the Minister of Defence in charge of national defence.

Two of the three poles – that is, the areas of the civilian intelligence service in charge of foreign intelligence and that of the military secret service – can be interpreted as a professional direction following individual, partly international models, while the third pole, which is considered the most complex, provides an all-internal-affairs approach while performing tasks related to national security. The steps leading to the development of the current organizational system, i.e. the major changes affecting the national security sector between 2010 and 2016, can be summarized as follows:

- In addition to the abolition of the former post of minister without portfolio in charge of the National Security Office renamed Constitution Protection Office (CPO) as a civilian security service,[24] and the appearance of the Special Service for National Security as the technical/support service for covert information gathering, the supervision and control of these two government agencies was delegated to the Ministry of Interior, thereby strengthening opportunities for cooperation with the police. The organizational change aimed at modernizing the Constitution Protection Office was started in May 2015[25].
- The entry into force on 25 April 2011 of the new Fundamental Law replacing the Constitution brought about changes for the national security services as well. The most significant of these changes is the fact that the Fundamental Law raised the activities of the national security services to a constitutional level and defined the

[24] The renaming of the National Security Office to the Constitution Protection Office indicated the rapprochement with the German model. The German and post-2010 Hungarian internal security services refer to the protection of universal constitutional fundamental rights (territorial integrity, national sovereignty, fundamental human rights, etc.), while in both countries the Constitution is called the Fundamental Law /Grundgesetz/.

[25] MOI Order No. 7/2015. (V.15.) on the appointment of a Ministerial Commissioner.

basic frameworks for their missions. (Paragraph 3, Article 46: "The core duties of the national security services shall be the protection of the independence and lawful order of Hungary, and the promotion of its national security interests.")

- Looking beyond the national security organization in the traditional sense, the events of the last decades indicated that terrorism must be reckoned with in the long term, so in 2010 the government, for purposes of performing its task of safeguarding security and the specific tasks of combating terrorism "in an efficient and unified organizational framework and at a high professional level"[26] issued Government Decree No. 295/2010 (XII. 22) on the designation of the agency responsible for countering terrorism and the detailed rules of the performance of its duties; the government established the Counter-Terrorism Center, thereby restructuring the tasks of countering terrorism.
- In mid-2010, the Organized Crime Coordination Center was also placed under the direction of the Minister of the Interior. The amendment was intended to strengthen the capabilities of responding to external and internal challenges, indicating the need to combat terrorism, to combat organized crime more effectively and to cooperate more effectively with the police.
- The direction of the Information Office responsible for intelligence activities and listed among the civilian national security services also changed. In mid-2010, the position of the minister without portfolio in charge of the former civilian national security services was removed, and the office was reassigned to the minister for foreign affairs. From 2012 onwards, the direction of civilian intelligence activities was included in the duties and powers of the Secretary of State in charge of the Prime Minister's Office, and from 2014 onwards in the duties and powers of the Minister in charge of the Prime Minister's Office[27]
- To make the picture complete, it is necessary to note that in addition to the transformations affecting the civilian national security sector, the two military secret services responsible for intelligence and counter-intelligence were merged in 2012 and the Military National Security Service was established. As a result, the former five-service model became once again a four-service one. The reasons for the merger include, among other things, increasing efficiency and more cost-efficient task management, a unified command and coordination of intelligence and counterintelligence activities, and the avoidance of duplication of efforts (Kovács, 2013).
- In 2011, the Government, upon the initiative of the MOI, reorganized the National Security Cabinet[28], whose meetings were again led by the Prime Minister. The heads of the Interior and Defense Ministries jointly coordinate the work of the Na-

[26] Bill No. T/10307 on the amendment of certain laws relating to countering terrorism.

[27] In July 2012, Parliament passed Act XCVI 2012 on the Amendment of certain laws related to the direction of civilian intelligence activities, thereby amending the direction of the IO in the NSA. The responsibilities of the Minister in charge of the Prime Minister's Office for the direction of the IO were established in Government Decree No. 152/2014 (VI.6.) on the Duties and powers of the members of the Government. (Subsection 13, Section 4).

[28] The National Security Cabinet was established in 1990 by the Antall government. Its meetings were attended by heads of ministries with responsibilities for tasks related to security policy issues. (The political body was headed by the Head of Government until 1998, by the minister of interior during the term of office of the first Orban government, by the minister of defence during the Medgyessy and the first Gyurcsány government, by

tional Security Work Group, which provides professional background support and prepares decisions for the Cabinet, and whose meetings are attended – in addition to the heads of the national security services – also by the national commanders of the law enforcement agencies.

- At the end of 2011, a Bill on the establishment of the National Information and Crime Analysis Center (NICAC) was submitted, according to which the planned new task of the emerging national security service would be to "monitor the security and criminal situation in Hungary, inform the government and perform analytic and evaluation activities"[29]. The bill also proposed the subordination of the Information Office (IH) to the Ministry of Interior. Finally, because of the different opinions on policy issues within the governing party, the Bill did not pass.[30]
- The massive migration wave, which also affected our country to an unprecedented degree, and the terrorist acts perpetrated in Paris in November 2015, accelerated the development needs of the counter-terrorism and civilian security services capabilities, at the forefront of which, both internationally and domestically, stood the strengthening of coordination within the law enforcement sector. In December, the government asked the Minister of the Interior to "set up an inter-ministerial working group to evaluate and analyze the new types of security challenges [information] and to identify possible directions for improvement."[31]

Following the terrorist acts in Brussels on 22 March 2016, in April that year, the Ministry of the Interior submitted for general debate to Parliament a Bill[32] amending the laws related to counter-terrorism, followed by extensive political consultations after the necessary professional preparation. The focus of the Bill was a proposal for the creation of a body responsible for coordinating and analyzing information at national level, the creation of a Counter-Terrorism Information and Crime Analysis Center.

By adopting the law[33] that affected the national structure of national security services, CTICAC could be established as a civilian national security service. Its direction is carried out by the Minister in charge of the civilian security services, in line with CPO and the NSSS. CTICAC's organization, created in the rising atmosphere of the fight against terrorism, points out that, considering international trends, besides the gathering of information done by the services, it is essential to have a sort of aggregated capability of analysis and evaluation of the information available in different places, increasing the efficiency of the whole system. The fusion centre is the general successor of the OCCC.

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the minister in charge of the Prime Minister's Office from May 2006 until the summer of 2007, and following that by the minister without portfolio in charge of the secret services.)

[29] Bill No T/5004 on the amendment of certain laws on law enforcement and on further related amendments to the law.

[30] Several amendments were submitted to the bill, which concerned inter alia the issue of direct linking of databases (www.parlament.hu/irom39/05004/05004-0024.pdf) and (www.parlament.hu/irom39/05004/05004-0004.pdf) Finally, on 30 December 2011, Members did not pass the Bill.
See http://hvg.hu/itthon.parlament/20111230_Pinter_NIBEK_Demeter_modosito.

[31] Government Decision No 1988/2015. (XII.28.) on the revision of certain legal regulations related to the new types of challenges and the possible directions of improving those legal regulations.

[32] Bill No T/10307 on the amendment of certain laws related to countering terrorism (April 2016).

[33] Act LXIX of 2016 on the amendment of certain laws related to countering terrorism (07 June 2016).

Among the primary reasons for the creation of the new body was the argument that in Hungary there had been no such organization in the security structure, "which aggregates and synthesizes data and information related to terrorism, crime and national security risks at government level, and assists in the making of the Government's decisions by providing all-inclusive security perspectives, tactical and strategic analysis and suggestions.[34] As explained in the general justification part of the bill, "CTICAC is responsible for compiling the most comprehensive picture of the country as a result of the processing and analysis of data related to national security, law enforcement, public security or other core security interests, other threats, the internal security situation, the state of public security. It operates an information system, prepares evaluation reports and submits them to the Government via the competent Minister."[35]

An important difference compared to other national security services is that the organization is not authorized to conduct covert information gathering activities and it acquires the data needed to perform its activity through a direct electronic data link. As an "Information Fusion and Information Sharing" centre, it can provide a "total security" approach to issues related to terrorism, crime and national security risks, and at the same time, the ability to promote national security. On the basis of the justification, the centre should also be able to "provide broad support for the investigative and intelligence activities of the cooperating government agencies, which includes tactical support of covert information gathering and prosecution from the initial stage, as well as providing or preparing start signals and analyses, respectively, that initiate procedures."[36]

Answers to Challenges (1990–2016)

Tendencies of organizational responses so far

The quarter-century-long developmental path of the Hungarian national security community described in the previous chapter is no different from other countries in that the changes affecting the national security sector, not counting the decisions resulting from the freedom of the government to shape its own organizational structure, can be evaluated as political responses to the event giving rise to the society's attention. Professional/policy-driven decisions (e.g. the merger of the two military national security services) were only applied locally to one organization, just as the upgrading processes were implemented only at organizational level (e.g. NSO 2007 and then CPO 2015). The reform according to the classical policing theory (Finszter, 2003 – quotes Hetesy, 2011: 20.), i.e. in the policy thinking encompassing the whole organizational structure and with the itemized transformation or re-creation of legal frameworks, has not taken place in Hungary (for the time being).

Due to the two-thirds regulation on the Hungarian institutional system of national security, the major changes could be implemented when the government had a qualified majority in the legislature. As a result, the 1994–1998 and then post–2010 government cycles

[34] Bill No T/10307 on the amendment of certain laws relating to countering terrorism, 37.
[35] Ibid, 35.
[36] Ibid, 36.

were decisive in the evolution of the national security system. Based on the organizational history overview presented in the first chapter, the following summarized findings can be made for the period 1990–2016:

- The Hungarian national security system (with respect to its fundaments) was predominantly built on the foundations of the pre–1990 party-state secret service system. A significant part of its strengths (continuity of professional knowledge base) and weakening factors (issues related to the party-state/state security history, which adversely affect the social support of the services on the domestic agenda) can be put down to this basic feature.
- After 2010, the Hungarian structure was adapted to the national security systems of the allied environment (Börcsök–Vida, 2014: 85.) by the government's endeavour to delegate the direction of civilian national security services to the ministries whose activities can best be supported by the service through information gathering. Until 2012, the Hungarian practice followed arrangements of the UK model, with the civilian intelligence service working under the ministry for foreign affairs, then those of the German model by placing the IO directly under the head of government. (The latter direction is indicated by the renaming of the civilian security service.)
- The removal of the post of the minister without portfolio can be evaluated in light of the fact that the professional divisions of the past have also been accompanied by a diversification of political direction and thus the Hungarian model has basically developed towards decentralization, while security challenges have affected the organizational cohesion of secret service work in other European countries. However, this process can be evaluated in a different light by placing a given secret service under the ministry in which the information gained can best be utilized, either through support for political decision or by supporting the work of other organizations working under the ministry.
- With regard to civilian security services, this can be further illustrated by the fact that the acquisition of information necessary for supporting political decision-making (*high policing*) and acquisition of information for law enforcement (*low policing*) are present simultaneously and the two are difficult to separate.[37] Both domestic and international experiences show the rapprochement of covert information gathering for criminal and intelligence services (with special emphasis on counterintelligence) and the need for closer co-ordination.
- The overarching reform ideas that have arisen over the past decades have not been able to gain ground not because of disagreement between the opposition and the government, but because of disagreements within the governments. It is noteworthy that the two political parties that played a decisive role in the development of the organizational structure endorsed each other's concept in their ideas. (While the HSP previously supported functional consolidation, its 2006 proposal finally concerned the model supported by Fidesz, the merger of IO-MIO and NSO-MSO, and vice versa:

[37] This approach to policing theory comes from Jean-Paul Brodeurt (1983), who distinguished information gathering in support of law enforcement decisions related to the higher interests of the state (high policing) from information gathering related to traditional police (criminal investigation, public order, etc.) tasks *(low policing).* Cf.: Kurtán, 2009: 2.

the merger of the military services in 2012 indicates the – half-way – implementation of the so-called HSP functional model).

- The Fundamental Law is a significant milestone. First, because it interprets national security services as an agency under the direction of the executive power and indirectly avoids the ideas that have raised or raise the potential of alternative direction of the service (e.g. by the head of state or by Parliament). Secondly, because national security services are essentially described as one (special) sector of the law enforcement agencies (see justification to Article 46), perhaps ending the decade-long debate that is/has been going on about the relationship between civilian national security services and law enforcement agencies.
- In Hungary's security policy thinking, both at the political and professional level, the need for developing cooperation at national level was recurrent. Successive governments tried to compensate the complex nature of the national security system with coordination mechanisms. At the organizational level, however, parallel to the international trends, the controlling-coordinating bodies (OCCC, CTCC Counter-Terrorism Coordination Committee) have emerged, but their creation as a national security service – despite the submission of the NICAC concept in 2011 – only took place as a result of the trauma caused by the terrorist attacks in Paris and then in Brussels, in 2016.

The actual effects of the CTCC concept – the organization was established at the time of writing the study – can only be prognosticated, at most. Ultimately, the legislator's expectation is that the operation of the fusion centre providing institutionalized coordination of national security and criminal information should move the so-called "competitive" national security system towards being "cooperative" and play a decisive role in creating a law enforcement/national security community system which preferably is professionally independent from the system of the prevailing political direction.

Basic activity – decision support

While the political (policy) responses to the challenges of the past quarter century structural processes have been relatively traceable, the operation of the various services, i.e. the so-called "evolutionary process involving the intelligence cycle[38], naturally, went on under the surface. The present study focuses only on the cornerstones and major trends, specifically discussing in the following subchapters the development of technical information gathering implemented within the National Security Special Service and primarily the development

[38] Basically, the term "intelligence cycle" is used in the Anglo-Saxon professional terminology, and it essentially covers the entire process of intelligence. The intelligence cycle can be interpreted chiefly in the context of the political decision-making function of the secret services (i.e. not for the activity used in police co-operation). For this reason, and since, according to some approaches, the concept no longer covers the intelligence work altogether, there is a lively discussion about its use today. The classical elements of the Intelligence Cycle are: 1. Receiving request for news/intelligence, 2. Acquiring data, 3. Data Processing, 4. Analysis, and 5. (Government) information. See more: Vida, 2013: 47–53.

of national security human resources management within the National University of Public Service in particular.

As regards the core activities of the national security agencies, i.e. operational information gathering and evaluation-analysis, it should be emphasized that their operation can only be successful if they are able to adapt to the environment more effectively than any other organization. The pre–1990 world order, as far as the challenges were concerned, meant a permanent medium, so internal structures also changed slowly. Today's challenges, however, require a faster internal adjustment of the national security organization, which, as the concept of intra-institutional stability thus gains another meaning, also requires a different attitude from the personnel.

The decision support (government information) activity of the services was the decisive factor in the development of the Hungarian national security system after 1990. From the second half of the 1960s, the processing of state security information, as well as informing the MOI, the state and the government agencies were already on the all-internal-affairs level.[39] This changed with the separation of services, and the four national security organizations (NSO-IO and MSO-MIO) developed their information systems along separate paths. (The NSA defines(defined) independent government information tasks only for the two intelligence services, among others it identifies the minister without portfolio, then the [MOI] as the minister in charge of the civilian national security services, and the minister [PM] in charge of civilian intelligence as those responsible for informing the government.)

The consequences of the disintegration of the uniform state security organization, and thus of the disintegration of the single institutional reporting system, have been recognized by the political leadership, as it may have been possible to receive reports from each of the four services that were synthesized at the decision-making levels and, where appropriate, contradictions were resolved. The issue of government information was therefore a virtually constant element of the dialogue on the Hungarian national security system, and the initiatives aimed at making the decision-making a single-channel and uniform structure were recurring all the time. The initiative to create an analytical-information unit within the National Security Bureau operating beside the minister in charge, which is still operating in 2010, may be evaluated as such, but from time to time the OCCC was also expected to play a greater role in coordinating government information.

Along with the coordination of decision support, services at both national and international levels are challenged by a feature of the information society as the information that was formerly only obtainable through the use of secret service means is now virtually accessible with just a few clicks on the computer. The scissors are thus locked in that the secret services should actually obtain the special information that cannot be obtained by other means and then put it on the table of politics. (According to a somewhat "more flexible" professional view, by placing the data in a national security context and analysing it in that context does it become secret service knowledge. However, there is a consensus that

[39] By the reorganization of the Information Processing Directorate under the direct control of the Minister, the MOI Data Processing Directorate was founded in 1977, which compiled, on the basis of a summary of information submitted by the MOI authorities – including the state security services – daily, monthly, quarterly and semi-annual reports for party and state leaders since 1982. In order to reduce previously existing duplication of efforts and to coordinate the information tasks, a regular consultation between the MOI, MOFA, MOD and the Information Office of the Council of Ministers was initiated from the early eighties.

in the reporting work the ratio of the data from the operations and from legal and/or open source are now approximately 20% vs 80%.)

In longer historical perspectives and in the past 25 years, it is true that in addition to the acquisition of information based on the classical human source of information, the use of various technical devices has become increasingly popular. Already in the last decade of General Directorate III, it was observable that in the daily operational intelligence reports, how the source components have changed, and the knowledge gained from the operational technical data collection has become increasingly pronounced. State security agencies reported 66,868 pieces of information for nine years after the establishment of the DOIR system in 1979, of which 34,905 were included in the Daily Summary Report of the Heads of Government. Their distribution shows the following picture (Table 1).

Table 1

Trends in information gathering by state security services, 1979–1988

Source of information	1979	1983	1988
"Network" members (human sources)	29%	33%	24%
Undercover intelligence/counterintelligence officers	14%	12%	9%
Official, social, one-off operational contacts, reports/notices	20%	18%	14%
Use of operational technical equipment (eavesdropping, bugging, wiretapping)	10%	12%	23%
Intercept of mail/postal parcels	7%	6%	15%
Other sources (information from other government agencies, open sources, etc.)	20%	19%	15%

Source: Urbán, 2007: 64.

The process has accelerated with the spread of the information society. It is aptly demonstrated by the fact that following the terrorist attacks in 2001, the great powers, and in particular the US intelligence community, have spent significant amounts of their budget on the development of technical and cyber-related data and information acquisition areas (Anglo-Saxon terminology: SIGINT, CYBINT)[40] pushing the classical method of Human Source Intelligence (HUMINT) into the background. The belief in the omnipotence of technical data acquisition was hampered by later acts of terrorism and the recognition that the broad and inexpensive availability of communication technology allows continuous adaptation and developing conspiracy by target groups. Among the lessons learned after Paris and Brussels, the need for a return to classical intelligence methods has been highlighted.

Following the trauma of the terrorist attacks in Paris and Brussels, the political leadership, on the other hand, as in the case of earlier terrorist acts (Madrid, London), advocated the development of international information exchange and cooperation. The idea of creating

[40] SIGINT: Signals Intelligence, radio detection, signal detection. COMINT: Communication Intelligence, Communication Detection. ELINT: Electronic Intelligence, Electronic Detection. CYBINT: Cyber Intelligence (Intelligence collected from Cyber Space) (Béres, 2014: 122–125.). Along with the development of technology, new methods have emerged, such as SOCMINT (Social Media Intelligence), which deals with the use of social media for intelligence purposes.

a common European secret service has emerged as a new element in the security dialogue, primarily as an idea raised by the Belgian government. It is unusual in that respect that a multilateral service with active operational capabilities has yet to be seen in history.

Similar political considerations do not take into account the fact that there is a permanent (IntCen) and temporary secret service cooperation (Club de Bern, Counter-Terrorism Group – CTG) within the EU; on the other hand, and more importantly, the need to create a joint secret service is incompatible with the fact that the services are essentially designed to protect national interests and have their tasks (e.g. counter-intelligence) that can only be interpreted at Member State level. Although the establishment of a joint secret service is not suitable for the EU institutional system, the need to develop international cooperation in some areas and to an appropriate extent cannot be questioned (Bilgi, 2016: 57–67.). In addition, the issue is further shaded by the fact that in connection with the Paris bombings the French authorities have repeatedly referred to the fact that the lack of external and internal cooperation, rather than the lack of concrete information preventing it, led to the disaster. They stressed that obtaining the necessary information cannot be imagined without risk-optimized capacities (Macaskill, 2015).

In the process of acquiring operational information and analytical work, especially in view of international terrorism gaining ground, the perception that intelligence activity is not only limited to the narrowly interpreted direct risk factors, but also the identification of background processes, and, where appropriate, should also be extended to a deeper understanding of the social roots. The background to this was primarily the development of predictive and preventive capabilities required of the secret services. For example, the need for the underlying understanding of the primary risks has led to the fact that the services are now paying more attention to the possibilities for radicalization of the individual within society, because it was mainly people who were socialized in the given country who could be linked to the assassinations/terror attacks perpetrated in the past decade.

After the terrorist attacks on the United States of America on 11 September 2001, debates flared up on the extent to which the individual's need for security could override the freedoms that are limited by the authorities, especially the secret services, as part of the measures introduced.[41] This dialogue is likely to have an impact on policy thinking for the next years or even decades, so much so that the debate after the Paris and Madrid bombings, it is in the forefront of public interest in Europe, and in relation to certain proposals of the terrorism package, also in Hungary.

The place, role and application of technical elements

In the complex system of national security activities, technical areas are indispensable in addition to the elements related to human sources. They look back on a broad historical background both internationally and domestically,[42] emphasizing that the build-up and use of capabilities are the result of a long process of development. Their operation cannot be

[41] For a summary, see: Dahl, 2011.

[42] As part of the defence preparations due to the imminent threat of World War I, as well as in response to armed conflicts in the Balkans, the Parliament – for the first time in the history of Hungarian parliamentarianism – adopted Act LXIII of 1912 on Exceptional Actions in Times of War. Section 8 of the Act authorized the

separated from processes in the external environment, as technological changes and changes in the range of sources of information prompt organizations to keep up to date with changes. The necessary legal frameworks, economic-budgetary resources, knowledge base, the availability of highly qualified human resources (Boda–Dobák, 2015: 17), and the adaptation of organizational structures to changing circumstances are the preconditions for development.

The technical capabilities of national security in Hungary also play an important role in detecting threats to security and in providing the necessary response that cannot be ensured without modern technical equipment and toolkits. Their application, beyond the intelligence and counter-intelligence functions, can contribute to the "timely detection and prevention of risks and threats, and the foundation of governmental decisions."[43] Examining the "secret service" elements of technical relevance, we can find a variety of practices in the international arena both in terms of their place within the national security structures and in terms of their integration. There are countries where the relevant background and tasks are shared between organizations, and in other cases they are concentrated in organizations.[44]

We do not want to discuss the conceptual classification of technical issues in detail, but it can be seen that while the intelligence-reconnaissance technical areas and capabilities represent distinct categories (e.g. SIGINT) and divisions typical of western (basically military) structures, this classification in the case of conditions in Hungary, although there are mutually matching elements due to historical development and sectoral differences, do not cover the characteristics of civilian national security services. Taking into account Hungarian characteristics, technical issues are basically examined in relation to specific areas of covert information gathering regulated by the National Security Act. In addition, however, the technical elements can be interpreted more broadly, thus in the case of the foregoing:

- overt and covert information gathering of various technical nature;
- information processing (analysis, evaluation) areas supported by technical solutions;
- technical development areas;
- (technical) expert functions;
- organizational elements responsible for information security and cyber security.

Based on the above, the national security system today regards the technical environment as one of the areas of *information gathering* required for the performance of its tasks, and on the other hand, the creation and continuous development of its capabilities also presents exceptional technical development as a *major challenge*.

For a brief description of *current domestic conditions,* it is worth looking back, to some extent, to the historical threads of technical information gathering capabilities and other technical areas. In Hungary, since the years before World War I, the means and methods of interception of radio transmissions and telephony were readily available, which were

government to wiretap telephone lines and inspect postal matters. This legislation was one of the first in the world to regulate the use of secret service techniques.

[43] Government Decision No. 1035/2012. (II.21.) on the National Security Strategy of Hungary, Annex 1, Point 48.

[44] For example, in the US, the NSA (National Security Agency) or the GCHQ organization of the British structure is an example of intelligence services that combine complex technical capabilities. Behind the combined capabilities, in addition to historical development, the need for military/civil or cross-border intelligence capabilities can also be sought.

subsequently expanded with technical solutions which made the bugging of a room possible (Urbán, 2012: 261–276.). These capabilities could be the basis for the emergence of separate, "technical security related" areas of state security after World War I (Müller, 2011). The development tasks and the need to create equipment for gathering information have come to the forefront, but development was only given real momentum from the mid-1950s. The scene for development was contemporary bilateral and multilateral co-operation with the European socialist countries, which (and their modified agreements, respectively), changed the direction of state security all the way to the political transition, utilizing various technical solutions.[45]

A real turning point in the development of technical areas was the establishment of the structure of the State Security General Directorate in 1962, when operational technical areas had already been given an independent directorate structure. Over the next thirty years there was a significant technical progress, wherein the development of device systems and capabilities, just like today, was a rather costly and, last but not least, a highly demanding area. Due to the isolation from the modern Western technologies, technical developments in state security were conducted in the framework of co-operation with the socialist countries and on the domestic base (including the involvement of the military/civil companies, scientific research institutes related to the state security sector). (Dobák, 2013)

Operational-technical regulations and methods requiring specific technical-engineering knowledge have been developed, thus the so-called Rule 3/a (wiretapping a phone line), Rule 3/e (bugging a room), Rule 3/r (covert photography, optics, video recording or CCTV recording) (Bikki, 2010), and the rules of their application[46], which ensured very strong secrecy in a classified form. In line with its rules of procedure, the Operational-Technical Directorate supported and served both the MOI State Security and the law enforcement and military intelligence, performing technical tasks for them in a substantially centralized manner.[47] The activities of the Directorate have been extended[48] at the national level from the provision, operation of (operational) technical equipment and conditions, to the specialization tasks, to the design and production of operational equipment, to the development of specific methods and procedures, or even to the training of the personnel concerned.

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[45] In international practice, technical intelligence has evolved, among others, along the professional concepts of SIGINT, COMINT and ELINT, in the socialist block countries, they became significant capabilities under the terms of radio detection/radio jamming or even operational technology. Operational Technology: "In a broader sense, the covert investigative (operational) means of state security law enforcement work […] in a narrower concept it is the totality of the technical – physical and chemical – means and methods used by state security and criminal investigative authorities during their covert investigative actions, which regularly obtain targeted, reliable information "(Gergely, 1980).

[46] Their application was regulated in Orders No. 0017 and 0018(1971 and 1972) and No. 35/1982 of the Minister of Interior of the Hungarian People's Republic

[47] According to the wording of the Regulations of General Directorate III (State Security General Directorate) established in 1972 and its subordinate units, among the tasks of the Operational-Technical Directorate is "the provision of operational technical equipment necessary to carry out tasks of the General Directorate, other crminal investigative organisations of the MOI and of Directorate 2 of HPA GS (Hungarian People's Army General Staff, Military Intelligence)". Source: Regulations of General Directorate III of the Ministry of the Interior.

[48] Regulations of Directorate III/V of the Ministry of Interior

The question of decentralization of capabilities emerged during the change of the regime[49], but, in parallel with the changes in the legislation affecting the application, decision-makers at the time decided to keep the technical areas together. Looking back over the past decades, this proved to be the right decision, as it enabled the cost-effective, targeted operation and continuous development of the Hungarian intelligence capabilities. In 1990, the technical basis of the state security structure being dismantled was transferred to the civilian national security services, to the National Security Office in particular, where it operated under the name of SSOTD (Special Services Operational-Technical Directorate) until the establishment of the National Security Special Service in 1996.

As far as its development is concerned, the initial period of the operation of the SSNS, as described in the publication published by the NSSS (Boda–Horváth, 2011), it was a period of the service becoming self-contained, a period of its realignment, of the creation of its internal regulations, of the establishment of the data management and registration system and of the replacement or upgrading of the earlier, outdated technical equipment. In terms of technical capabilities, the reconstruction of monitoring fixed-line digital, then mobile networks and the establishment of a national smart system, the development of a radio monitoring system responding to changes in the external environment, and the establishment of a data reporting system (Dinya–Raáb , 2011: 17–23.), but the development of an IP-based communication monitoring system and the upgrading of the technical level of the wiretap system in the mid-2000s can also be included here.[50]

Even after this, the deployment of the new lawful monitoring capabilities of a technical nature continued, in line with the needs of the customers, as the "services" provided were continually forced by the changes in the external technical environment to evolve. Certain areas of technical information gathering, which had previously dominated, were often pushed into the background or were dismantled due to technological changes and the disappearance of information sources, and new information gathering needs and opportunities came to the forefront as info communication gained ground.

The SSNS, with its set of tasks as a national service provider – Paras (a) and (b) of Subsection (1) of Section (8) of Act CXXV of 1995 –, has been a key player for more than twenty years in the area of performing tasks of a technical nature of the domestic covert information gathering activities. It is a key player, because its capabilities in certain areas are exclusive in the (national) security structure, but in other service areas its performance of tasks cannot be considered exclusive, as those tasks can also be carried out by separate organizations, depending on their capabilities. Given the organization's set of tasks, the customer agencies "do not have to operate the special expertise, the personal, technical and infrastructural backgrounds separately" (Boda, 2012: 124). With the exception of CTICAC, which is not authorized to conduct covert information gathering, as a service provider organization, it supports the national security services, the police, the National Protection Service, the Counter Terrorism Center, the National Tax and Customs Authority and the

[49] The proposal for the organizational structure of the operational technical support of the national security services established in 1990 and of the criminal investigative units of the police was expected to be made by the a committee set up by the Council of Ministers. Source: CoM Decision No 3039/1990 on the establishment and conditions of operation of national security services, Paragraph 2.

[50] Dr. Zsolt Molnár's parliamentary speech (16/1/2006) and http://docplayer.hu/9553751-11-cim-polgari-nemzetbiztonsag-szolgalatok.html.

Public Prosecutor's Office. All this indicates that in the domestic (national) security system, the organization is a key actor, offering its services to its customers on an equal footing.

To this day, the service also monitors the changes in the external environment, seeks solutions to technical challenges, and increases efficiency of service. The introduction of an electronic service request system aimed at secure, electronic transmission of requests for covert information gathering, quick service provided to the requesting organizations, and preparing the request-related files in an electronic format.[51] In recent years, the service has also been active in other areas to actively respond to changes affecting the efficiency of the whole law enforcement sector and the challenges of the external security and technical environment. This includes the creation of a facial image analysis registration database[52] that is a step forward in the administrative protection of document security, crime prevention and the identification of unknown perpetrators.[53] The amendment of the NSA in 2016[54] may substantiate further "capacity development," behind which there is a change in the explosively evolving external technical environment and the presence of information on the one hand, and the need to provide legal control options on the part of the state and the increase of effectiveness of the "system," on the other. The amendment to the law shows that in many cases this necessarily can only be ensured through an obligation to cooperate with an external party[55], a solution that cannot be regarded as new or as a domestic idiosyncrasy.

As is apparent from the set of tasks of the organization, in addition to the technical aspects of covert information gathering, mentioned earlier in this chapter, the areas of development and expert work as well as cyber security are also present. The latter is an example of a new organizational element of the NSSS's organizational system, the GovCERT-Hungary, which was integrated in 2013. It provides its services to governmental organizations and local governments, with "the management and resolution of incidents that are used as a channel of attack against the Hungarian and international network security and critical information infrastructure organizations [...]"[56]. In October 2015, as a significant turning point for state-level cyber security, by focusing on the relevant tasks and areas of expertise, the National Cyber Security Center[57] was established. In the field of cyber security, which

[51] As a result of the development work that began in 2007 and lasted for several years, the lead time of the receipt of documents required for placing a request and the number of printed documents significantly decreased (Kovács Z., 2013: 171–183.).

[52] *A registration system of facial image profiles is going to be created* (2015) and Bill No. T/6623 on the registration of facial image analysis and the facial image analysis system.

[53] Act CLXXXVIII of 2015 (27.11.2015), on Facial image analysis registration and facial image analysis system; MOI Decree 78/2015 (XII. 23.) on the Detailed rules for operating the facial image analysis system and Bill No. T / 6623 (20.10.2015) on Facial image analysis registration and the facial image analysis system.

[54] Act LXIX of 2016 on the Amendment of certain laws related to countering terrorism

[55] Act CVIII of 2001 on Electronic commercial services and on certeain aspects of services related to the information society (Sections 3/B and 13/B) and Government Decree No. 185/2016 (VII.13.) On the order of cooperation between the service providers providing applications with encrypted communication and the organizations authorized to conduct covert information gathering.

[56] The website of the National Cyber Security Centre is at: www.cert-hungary.hu/node/1.

[57] The Institute was established on October 1, 2015 as the organization of the Government Event Management Centre, the National Electronic Information Security Authority and the CDMA (Cyber Defence Management Authority) activity. Source: Ministry of the Interior Communiqué (1) – 1 October 2015, National Press Service.

is relatively new[58] in Hungary, the Institute can carry out complex tasks (e.g. Bencsik, 2015) within the system of the central government, local government and vital systems within an organization system, to the security of electronic information systems. The compartmentalization of activities previously carried out by several organizations (official tasks: National Electronic Information Security Authority, vulnerability analysis: National Security Authority, IT security event management: SSNS GovCERT) has ceased to exist.[59]

In summary, it can be stated that technological progress in the future will be unstoppable, and this will force the technical areas of national security services to be constantly renewed and improved. New and emerging technologies as well as new means based on them are emerging in our information society, which shape the necessity of developing legitimate control solutions as well as the creation of other capabilities. Regarding the elements of data acquisition necessary for the efficient and effective performance of national security tasks, in addition to the "secret" elements, the possibilities of accessing available data outside the closed national security system, or even open-source but technically related elements, are becoming increasingly important. Requiring special expertise and knowledge, the value of the areas related to experts, analysts and cyberspace is constantly increasing.

In today's security events, society can also expect the services concerned to possess the cutting-edge technologies that contribute to increasing the security of communities. With a foreign perspective, due to the complex system of national security, the relevant development directions include the development of cyber defence, national security and criminal technical capabilities, data protection and new security solutions, including border protection, counter-terrorism, proliferation of weapons of mass destruction, as well as the pronounced need for sharing security related information.

The problem of human resources, generational change and training

The efficiency of national security services is largely due to the continued availability of qualified personnel. Behind this statement, there is a wide range of human resource management and training activities, since over the last 25 years the Hungarian national security services could not avoid any changes in the external environment. Nowadays, our information society, as well as the changing security environment, are constantly forcing the services to evolve, let us just remember the life career model[60] introduced in 2015 or the evolving system of training courses, but also the issue of generational change.

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[58] The National Cyber Security Strategy of Hungary was published in 2013 [in Government Decision No. 1139/2013. (III.21.)]; Act L (IV.15.) of 2013 on electronic information security of state and municipal bodies; Government Decree No. 233/2013 (VI.30) on the Duties and powers of the government event management centre, sector event management centres of electronic information systems and critical systems, further on the duties and powers of the event handling centre of critical facilities.

[59] By the amendment in 2016 of the NSA this task was included in the basic mission of the NSSS at the statutory level. Paragraph i) of Subsection (1) of Section 8 of the NSA reads: The NSSS "performs information security tasks related to the electronic information security of public and municipal bodies according to the provisions of the law."

[60] The National Assembly adopted Act XLII of 2015 on the service relations of the active-duty personnel of the goverment agencies performing law enforcement functions, including the active duty personnel of the civilian security services, on April 14, 2015

Nowadays, civilian security services are staffed on the basis of the relevant legislation [Subsection (1), Section 20 of Act CXXV of 1995 on the National security services], the personnel consisting of government officials, active duty members and public-sector employees. In terms of the staffing of civilian security services under the Ministry of Interior, the strength of the Constitution Protection Office foreseen for 2016 is 1226 (1155 in 2015), while the strength of the Special Service for Natinal Security for 2016 is 2189 (2184 in 2015).[61] The foreseen strength of CTCAC in 2017 is 130.[62]

The most decisive of the legal relationships is the active duty service relationship, which, as a special service relationship, clearly indicates that the "active duty service is a profession pursued in a chain of command, amidst increased risk" [Subsection (1), Section 21, Act CXXV of 1995]. All of this, by definition, defines the human resource management activities of the services, so in accordance with the relevant legal requirements, specific recruitment and training systems are in place. Fitness for active duty service, willingness to be subjected to national security vetting, meeting the qualification and special qualification requirements for the service post, followed by continuous professional compliance with the given service post and development, fitting into the organizational culture and embracing it, and the commitment to the profession are all factors that have a continuous impact on the functioning of the entire system.

As mentioned earlier, from a historical perspective, more than 25 years ago, during the dismantling of the state security structure, the question arose whether the establishment of the national security system should be started from completely new grounds and personnel or should the organizational legacy of the former services be built upon by restructuring it.[63] Political decision-makers at that time, with a reference to the aforementioned, chose the latter solution, thus retaining part of the special professional culture and personnel within the system. Restructuring based on CoM Decision 3039/1990[64] on the establishment and operation of national security services had to be carried out by transferring personnel from the MOI in such a way as to"have a core personnel of the national security services with a with lower staffing levels and better professional skills than the personnel of the former state security services in the Ministry of the Interior".[65]

All this ensured continuity and the professional knowledge required for work, but also anticipated the need for professional preparation, as the original personnel left the service simultaneously with the emergence of new generations. Nowadays, the backbone of the services with strong organizational culture and regulated work environment is already

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[61] Source: www.parlament.hu/irom 40/04730/adatok/fejezetek/14.pdf (28.07.2016.) The strength of the Information Office in charge of civilian intelligence is not public, see at: www.parlament.hu/irom40/04730/adatok/fejezetek/11.pdf.

[62] www.parlament.hu/irom40/10377/adatok/fejezetek/14.pdf.

[63] A publication in *Home Affairs Review* "Interview with Dr. Péter Boross" gives an insight into the the background of the government's concepts related to the selection of the personnel of the civilian national security services established in 1990.

[64] The CoM Decision dated 2 February 1990, and declassified in 2008, defines the stages of the creation of "national security services", such as complementing the personnel, providing the necessary special buildings, material, technical conditions, resources etc.), see: www.parallelarchive.org/document/1833

[65] CoM Decision No. 3039/1990, Paragraph 4

made up of members of generation X and generation Y[66] who have different "labour market" characteristics in many respects. A study on this topic (Zalai, 2016: 36.) found that as long as generation X is "characterized by reliability, being under control, being motivated and career-driven," then members of generation Y "experience their relationships virtually and in reality." As the study also explains, each generation has different attributes that can be beneficial for organizations, so efficiency can be promoted when several generations are present together in an organization.

This is also true of the national security services that search for their "new recruits" along their complex system of tasks. Persons with various professional backgrounds and qualifications are introduced into the system, but there is a need for organizations to fill jobs that require different basic skills. In the light of the above, training is one of the areas that by imparting a common professional basic and specialized knowledge, further by providing guidance in organizational values can contribute to the creation in the long run of a stable personnel, dedicated to the services and their values.

Outlining the topic of training: before the regime change, the Department of State Security of the Police Officer Training College provided the preparation of the personnel, but this higher educational-professional training opportunity ceased to exist in 1990. Subsequently, in order to provide the necessary human resources, civilian national security services "recruited their personnel directly from universities and colleges, and in-service training courses were organized for the new recruits" (Boda, 2016b: 146). On the one hand, the introduction of newer generations to the further development of the services in the civil environment with freshly acquired knowledge (for example, technical, IT or legal knowledge); on the other hand, it necessarily raised the high priority task of training and professional preparation. Without any pretention to completeness, it can be stated that the training needs and their internal content have changed along with the development of the external technical environment, changes in security policy, intensification of international cooperation or even changes in the legal environment.

With regard to the human resource management of the national security services, several studies and academic research results have appeared in recent years, examining, inter alia, the education and training of the personnel of the services. The topic of training was discussed at open academic conferences (NUPS, 2012, 2014). The question arose whether the admission of people with civil qualifications and foreign language skills was more beneficial, as they "only" needed in-service professional training than if the organization provided the necessary professional knowledge in a training framework of a closed form of higher education. In this regard, "not even the Hungarian national security services see eye to eye." (Kis-Benedek, 2014: 25.)

There are understandable reasons for this because, due to the complex nature of the national security activities, some of the necessary competences are available in the courses of the specialized civilian HEIs (IT, language, law, etc.), and to acquire the competences required to meet the special needs of national security activities however, there is no possibility in the civil higher educational environment. The acquisition of these can be done on

[66] There are several age groups associated with the designation of generations, for example: generation X (born between 1961–1981), generation Y (born between 1982–1995), generation Z (born after 1996–2010). See more in Pais, 2013.

the one hand at the in-service training courses and, on the other hand, in certain elements of the closed national higher education framework, which allows for the purposeful acquisition of the professional knowledge.

Different practices have emerged, in which, however, a common element is that professional training is preceded by admission to the ranks. This is true both for attendance of in-service professional courses within the organizations and for the higher education national security training programmes to be described later. Among the reasons for this, we can mention the existence of specialized knowledge in the system and the existence of professional and practical conditions for acquiring knowledge. Another common element for civilian national security services is that students admitted have to attend internal professional training courses lasting for several months, which are "tailored to the needs of the given organization, and the reason for the differences in the subject and the duration of the training is to be found in the training needs arising from the different sets of tasks". (Zalai, 2012: 123.)

Although the former state security training was abolished during the regime change, the idea of developing training courses for the national security services newly established did not disappear.[67] The Police Officer Training College wanted to expand its education framework in the mid-1990s with civilian national security training, but it did not materialize then. Progress was made towards the end of the decade, when national security re-emerged in higher education, when bachelor and master courses in national security were accredited as a result of the ideas and preparatory work along the lines of military national security training needs.

In several stages, the training documents, curricula were developed for the bachelor and master's degree national security courses built on one another, and the education programme could start: The Department of National Security ensured the coordination of the degree programs. Later, among the civilian national security services, the then National Security Office and the Special Service for National Security also indicated their needs to take part in the training (Héjja, 2014: 13.), so some members of the personnel of the relevant civilian national security services appeared among the day-time students. The establishment of the National University of Public Service brought about change in this educational and operational structure, and from then onwards the national security higher education was already given its separate place among the various courses, identifying the supervisory ministers as well.[68]

Regarding the organizational framework of the training, and in the area of training related to the organizations authorized to conduct covert information gathering, the National Security Institute[69] of the University was set up as a standalone institute, not affiliated with

[67] The Mission Statement of the Police Officer Training College: www.rtf.hu/kuldetes.html.

[68] The minister in charge of law enforcement, in addition to the law enforcement higher education, prepares the enrollment plans for the portfolio in the civilian area of national security higher education, and the minister of defence, prepares the enrollment plans of the portfolio, in addition to military higher education, in the military area of national security higher education. See: Section 2, MPSJ (Ministry of Public Service and Justice) Decree 1/2013. (I.8.)

[69] The National Security Institute is considered unique on the national level in terms of national security services, and its creation made up decades-long arrears. As for to its internal structure, it has a Civilian and a Military National Scurity Department and, since 2015, has a Counter-Terrorism Department. See: http://nbi.uni-nke.hu/intezetunkrol/az-intezet-rendeltetese

any faculty. After the preparatory work of the Department of Civilian National Security, the "civilian" national security training started in 2013 as the civil specialization of the national security bachelor and master's degree. As a further step, as it were, efforts are currently underway, aimed at developing specialization to be launched at the Police Science Faculty, which is more closely aligned with the needs of the internal affairs sector, where both the bachelor and the master's courses have been formulated for human intelligence, technical intelligence and counter-terrorism specializations.[70]

The new higher education training programs have also led to opening up, since these training programs need to provide students with a comparable qualification at international level, in line with the Bologna process and the higher education frameworks. It is important to continuously improve the training, as we are talking about a training scene where students from national security organizations and other organizations authorized to conduct covert information gathering need to acquire qualifications that are equal to those of the civilian sphere but are purposeful and meet the needs of the organization delegating the student to the university. The established Hungarian structure can be viewed as forward-looking even in the international arena, encompassing both the basic and the master's degree and the possibility of continuing PhD studies. As a result of the training courses, specialists looking at security in a comprehensive way with an expert eye, capable of understanding security and willing to work together in a team can assist the work of the services.

The national security subjects built into the requirements of the law enforcement specialized exam organized by MOI PSPDGD[71] can contribute to the efficiency of the cooperation between the organizations and the overall security approach, whereby students from the given services can make choices in order to acquire knowledge that is closer to their tasks. The issues of the sphere appear in the mandatory subjects of the exams, among the elements of the subject of public administration and integrated law enforcement leadership, and in an optional manner, the national security administration exam[72] subjects whose main purpose is to "provide general knowledge of issues related to the national security system." The subject, as well as its students and instructors, goes beyond the civilian national security structure defined in the NSA, providing new knowledge about the operation of other organizations in the law enforcement sector. The significant progress in the training areas over the past period generally indicates that national security requires ever-wider interpretation and systemic thinking.

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[70] As a result of the wide-ranging specialization work, the training and output requirements of the Civilian National Security Course were introduced in 2016, thus defining the framework of new higher education programs in the system of higher education in Hungary. See Minister in charge of the PMO's Decree 7/2016. (II. 15.)

[71] Centre for Law Enforcement Basic and Specialized Exams of the Public Service and Personnel Development General Directorate (PSPDGD)

[72] The subject of the exam consists of knowledge related to the activities of the CTC, CPO, NSSS, NPS and CTICAC. See Government Decree No. 274/2012. (IX.28.) On the law enforcement basic and specialized exam, on the Law Enforcement Basic and Specialized Examination Board, and on the list of examiners at the law enforcement basic exam and the list of the Board of Examiners at the law enforcement specialized exam, Annex 2 II/20, further http://bmkszf.hu/dokumentum/231/kvetelmnyrendszer_2742012.pdf.

Addenda for a vision

After a historical review of the paradigm shifts of the past quarter century and the summing up of the experience, it is justified that the study should attempt to give an insight into the major issues of the next years or even decades concerning the national security organization system. Of course, all this is closely related to the security challenges that Hungary is going to face. If we accept the common approach that the tasks of secret services include the protection of interests of national security in the traditional sense (sovereignty and constitutional order), in addition to enforcing the political and economic aspirations of that state, today they also include the prediction of processes that endanger the European value-based social welfare model, the potential risk factors will be significantly expanded. In preventive thinking, security strategies have a pivotal role to play, which can only have a real impact together with the appropriate practical measures.

In terms of a broad understanding security, a number of international forecasts[73] address future challenges, short- and long-term security strategies,[74] which implicitly influence the activities of the national security services working to safeguard security. In Hungary, the national security strategy[75] emphasizes the area of national security at a specific point, saying that "intelligence and counterintelligence are an important element in the implementation of the security strategy, the protection of the sovereignty of our country, the protection of its constitutional order, the security policy objectives and the promotion of its national interests."

All this requires "strong intelligence and counterintelligence" capabilities thus, in the case of the national security sector they have responded to performing tasks more efficiently and to changes in the security environment by modifying the operating framework, improving resources, increasing cooperation and adjusting co-ordination. This includes, but is not limited to, legislative changes, increased resources, or even cyberspace and the ongoing development of covert/overt human/technical information gathering capabilities. We do not intend to go into details of the changes in the security policy environment, but we want to highlight some of the effects on these Hungarian security systems:

- *Geographically,* the tasks of national security services have widened, as a significant part of the threats to security come from outside the country, and often their sources can be searched in processes and events in remote geographic areas. The transnational nature of impacts is further strengthened by the rapid change of our info communication environment, as a factor for the development of human and technical information gathering areas beyond national borders.[76] Recent European terrorist acts and migration processes have demonstrated the cross-border nature of the challenges, the complexity of security-threatening factors, the presence of political,

[73] One of the best-known global forecasts is the *Global Trends* series of the United States National Intelligence Council (NIC). These are issued four times a year, five forecasts have been issued so far, and this is the case for a 2030 forecast published at the end of 2012 *(Global Trends 2030).*

[74] For example: European Commission, 2015.

[75] For Hungary, Government Decision No.1035/2012 (II.21.) on National security strategy, Annex 1, Paragraph 48 is the determining document

[76] All this is demonstrated by international scandals around technical intelligence gathering. See GREENWALD, 2014.

economic and humanitarian elements. Their impacts may be at the national level beyond the organizations, the creation of the necessary organizational skills and cooperation.

- *As for primary challenges* in Hungary in the medium term, migration and associated "accompanying phenomena" (terrorist risk, organized crime) need to be addressed. A permanent, complex challenge is the sustainability of the performance of the Hungarian economy exposed to the European and global environments. These challenges, however, cannot be interpreted in themselves, without the examination and analysis of the appropriate contexts. National security services should therefore increasingly focus on the background of the processes.
  - *In a counterintelligence approach, f*or example, the most recent European attacks have highlighted that terrorism and organized crime are much more closely interconnected to each other than previously assumed, as the logistic background needed for the attacks (firearms, smuggling, etc.) was provided by criminal organizations. Accordingly, more emphasis should be placed on not only the prevention of a specific terrorist act, but also the identification of elements that are indirectly involved in it.
  - *Intelligence-driven thinking* also needs to broaden the angle of view as – dwelling on migration – the stability and attitude of the source and intermediate countries play a key role in its evolution. It is a professional commonplace that globalization speeds up the spread of regional risks, so it is important for intelligence organizations to analyze processes around the world with appropriate sensitivity and optimal forecasting capabilities. (Some secret service theories call it the export of risks.)
- *As regards technological advancement,* the importance of global cyberspace has to be highlighted as a key element. This, besides its peaceful use, also presents significant threats for the state and society concerned. With the exception of military applications, efforts against adverse intelligence in cyberspace, cyber terrorism or even cybercrime, will be crucial for both national security organizations and other organizations responsible for security.
- It is worth pointing out that while the most up-to-date devices and solutions appear in the short term along illegal activities, organizations working for the security of the nation need to consciously prepare for the creation of legitimate control capabilities, with a long-term perspective. Today, countries in the developed world are continually improving their cyber capabilities by utilizing the work of the external IT development sector. The time between new developments and the use of results has been shortened. The range of services is expanding, while costs are reduced.[77] The technological superiority of developed countries is already visible, highlighting the fact that "security, defense, intelligence and offensive capabilities in cyberspace will also have an impact" (Dobák–Szűcs, 2015: 87.) on the national security systems of the states.
- The national security organizations are exposed to significant, vast volumes of information that change in form. "The services concerned must select, evaluate

[77] NIC (2000)

and analyze the information necessary for the performance of their duties from this mass of information, in accordance with strict legal regulations. The form of all this is and has been going through significant changes" (Dobák-Szűcs, 2015: 87.), because of the Internet and info communication solutions, applications have become an indispensable part of our daily lives. Elements of open information gathering are appreciated which can with ever greater subtlety serve purposes of the collection, analysis and evaluation of valuable information supporting decisions.

- In order to respond quickly to the challenges and the threats, to avoid duplication and to support higher-level, comprehensive decisions, the so-called fusion (information fusion and information sharing) centres are coming to the forefront of national security activities. Regarding the use of structures that focus on information and expertise that increase the effectiveness of the use of existing capabilities at national level, professionals now have extensive experience.
- National security activities today can no longer be conceived without the broader cooperation areas of the organizations and without the exchange of information. Here we must mention international co-operation, professional relations between EU Member States and their national authorities, but it is important to emphasize the communication and info communication service providers involved in the development of the info communication environment and the intensification of the dialogue with the IT sector. The EU's relevant security strategy states: "In 2015, the Commission will launch an EU-wide forum for mainstream IT companies to curb terrorist propaganda on the Internet and social media and to find ways to address the concerns of law enforcement authorities in relation to new encryption technologies."[78]

Based on the above-sketched summary of the risks, the most important requirement for modern secret services in the next period is to continuously be able to adapt to their environment – finding the right balance between the obligations of tradition and the need for adaptation. This will necessarily accelerate the modernization of the security institutional system, and beyond the organizational responses, it will further expand the toolkit and will further enhance the national security activity. The most dynamically developing area is cyber defence and cyber security, whose independent organizational and professional frameworks are currently being formed. (Think of the road to the creation of the already mentioned National Cyber Security Center)

With regards to the evolution of the Hungarian national security organization system, one of the most important experiences of recent decades is that the reforms should not be confined to symptomatic levels and sub-areas, and not to the formal approach of "less deadwood, larger budgets, better equipment, and information systems" (Hetesy, 2011: 20.) but rather the actual and comprehensive operation of the system should be focussed on. As demonstrated above, Hungarian reform experiments started with a broad-spectrum vision, with the need to transform the entire national security system, but ultimately it was limited to the level of an organization. The public could perceive that within the given political

[78] The European Agenda on Security 2015 mentions, along the three priorities (Prevention of terrorism and Combating Radicalization, Fighting Organized Crime and Combating Computer Crime), improving information exchange and cooperation see http://europa.eu/ rapid /press-release_IP-15-4865_hu.htm.

force there was no agreement to act. It should be added, however, that the understanding of the profession, at least in terms of the main directions, and the crossing of the institutional lines laid down in 1990, are essential for a change resulting in substantial, effective adjustment and efficiency gains.

It is necessary to point out that these dilemmas (modernization vs. traditionalism, traditional vs. modern means and methods, etc.) are not only characteristic of domestic but also of foreign national security systems. If we compared the Hungarian national security structure of 2010–2012 to the British model solutions, it is worth mentioning that issues related to the intelligence organization system are constantly present in the famous island of tradition. So much so that this topic has already been found in pop culture, as the latest James Bond film (*Spectre,* 2015) focuses on the problem of merging and the MI5 and MI6[79] in one shared office building, with an information system in the background, linking the databases of the world's largest intelligence services.

A brilliant description of the British perception of secret services is given in the film in that the politician in it who, though risking the effectiveness of the system, took the lead in the reform efforts was portrayed as a negative figure. While in Hungary it is against the unwritten law merely a quarter of a century old to speak about the centralization of national intelligence capabilities, – in international specialist terminology this is also called globalization of intelligence services (Svendsen, 2012) – centuries-old traditions would have to be overcome in Britain.

Alhough the Counter-Terrorism Information and Crime Analysis Centre is not a clear example in international practice, it definitely recalls the Anglo-Saxon models that it seeks to counterbalance a wide-ranging national security system by coordinating and governmental decision-making activities[8080] by aggregating information from the services. There is some discrepancy in the fact that the coordination tasks related to operational management are separated from decision support by separate organizations such as the Joint Terrorism Analysis Centre (JTAC) within the British MI5 and the National Counter-Terrorism Centre (NCTC), while these functions are present together in CTICAC.

With regard to future operations, it is advisable to pay attention to the experience of the Anglo-Saxon centres that they have been faced with major arousal against "traditional" services. This is perceived in the following opinion of a senior official of the FBI – published in the Hungarian press – as follows: "[...] and then we did not even talk about the Office of the Director of National Intelligence (ODNI) that was often underfoot, while the FBI hardly benefited from its activity at all." (Kessler, 2012: 7). It is therefore important that the Centre carries out its activities based on professional agreement and the principle of reciprocity. If this happens, it ideally functions as a kind of "information cloud", going

[79] *Military Intelligence, Section 5, Section 6.*

[80] In the United Kingdom, it is the Joint Intelligence Organization of the Prime Minister's Cabinet, while in the United States it is the Office of the Director of National Intelligence (ODNI that is in charge of controlling the 7-member national security community in United Kingdom and the 17-member national security community United States and of the implementation of uniform government information tasks based on intelligence information. ODNI's legal authorities have been expanded so far in the past decade that, evaluating the performance of the services, they can make proposals for the budgets of those organizations.
See www.gov.uk/government/uploads/system/uploads/attachment_data/file/61808/nim-november2010.pdf and www.dni.gov/index.php.

beyond the paradigm of the information cycle, because instead of intermittent/cyclical co-ordination of intelligence needs, it can be a continuous mediator, buffer between the professional organizations and politics.

On the other hand, the "cycle" of information acquisition (intelligence cycle) also needs to be re-interpreted as the "path" between data acquisition and use (decision), again underlining the condition of the ideal operation of the system, is significantly shortened. In tandem with that, fusion centres also generate new challenges, as the approach of national cyber security based on the principle of global cyberspace requires greater protection of the IT tools used, emphasizing that states have a greater influence on the (re) distribution of IT knowledge.

The evolution of the information society has left behind the phase in which much of the information obtained through the use of covert means has now become accessible via the Internet. It has entered into a phase which is – especially through social media applications – marked by large data sets having been created (see the theory of big data) whose analysis and application of information also takes place in the open information space. In this medium, on the one hand, a more sophisticated approach is required for the identification of the data that can actually be obtained only by using covert means and methods. This inevitably entails an increase in the cost of using the secret service means. On the other hand, it may pose a risk to the national security service if it voluntarily renounces the use of (traditional) intelligence means and relies heavily (or even exclusively) on using open information. By doing so, the secret service may lose its "competitive edge" and be forced to compete with organizations (think-tanks, the press, public opinion research institutes, etc.), which at a number of points (e.g. through information channels not tied to the hierarchy or the looser forms of financing) are in a stronger position.

As mentioned above, the impact of the globalization of the secret services is partly due to the fact that, typically after the end of the bipolar world order, typology is increasingly complex. Services that can be listed under the so-called traditional category, additional types of security services have emerged in the security environment. Accordingly, we can distinguish (at least) seven types (Börcsök–Vida, 2014: 68) functionally, not counting the mixed solutions. It shows the complexity of the present Hungarian structure that virtually all of them exist in the (national) security system in the broad sense:[81]

- intelligence service (IO),
- counterintelligence agency (CPO),
- service in charge of technical data acquisition (SSNS),
- coordinating-controlling (fusion) centre (CTICAC),
- service with official investigative powers (NBI),
- data protection organization (National Security Authority), and
- integrated (intelligence-counterintelligence) secret service (MNSS).

[81] Here we have in mind a total security structure that goes beyond the Hungarian national security institutional structure defined by Act CXXV of 1995 on the National security services (National Bureau of Investigation, Counter Terrorism Centre, National Protection Service). In the context of this study, we do not wish to address the institutional differences resulting from the different uses of covert information gathering and its use for different purposes.

Jurisdiction plays a dominant role in almost all national structures. However, the importance of frontiers has lost its traditional perception, and this is managed by these systems based on jurisdicitions with difficulty and/or through complicated coordination mechanisms. Because there is information coming from across the borders that is valuable from the point of view of counterintelligence, and vice versa, it is possible to gain knowledge of a foreign country within the boundaries of a third country and it is significant in terms of intelligence. Although the problem can be solved by appropriate coordination, by coordinating the work of the intelligence and counter-intelligence services, some centralization ideas still point in the direction of building national systems based on an activity profile such as human, technical data acquisition and information analysis services (Swendsen 2012: 112.)

We do not wish to make recommendations within the framework of this study on the structure and operation of the Hungarian national security system, since the structure is basically built as a result of political decision, and it is the task of the profession to operate it. The focus is mainly on the latter, since, using a commonplace of theory of organization, a formally well-structured transparent system can be operated poorly, and a bad system can work well if responsibilities are clearly laid down, appropriate professionals are available, and the interaction of the organizational elements is ensured.

The purpose of the study is essentially to outline the processes and events of the past quarter century that played a part in the development of the Hungarian national security community. We have deliberately highlighted the cornerstones that we think may occur in the next years or decades, in different forms, and with alternating emphasis, once again as challenges. We trust that this study can provide support for the interpretation of all these.

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Economic and National Security

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Abstract

The analysis covers the major trends of the Hungarian development path and their critical junctions, reflecting on the turbulent years of the economic regime change that followed the collapse of the planned economy, and also looking into the evolving tendencies of the first third of the 21st century. Particular attention is devoted to financial imbalances, since they have caused repeatedly social tensions in Hungarian history, or unsolved problems of the socio-economic system have manifested themselves in such imbalances. The main conclusion of the analysis is that in spite of structural modernisation and institutional progress, the Hungarian economic performance has, for a longer period, been mediocre or below the average if compared to CEE benchmark, making Hungary, a fully-fledged market economy, lose ground in the region. Demographic trends, weakness of productivity and wage growth, increasing gaps in income and wealth inequalities, emigration of skilled labour force all comprise a situation that is unlikely to trigger social crisis but it may push Hungary onto a slow growth track. Getting stuck in the process of real convergence with the more advanced European member states would weaken the legitimacy of the social order and intensify tensions between generations, social strata and sub-national regions. A centralising government can initially stabilize the economy, but high centralization may, in medium term, reduce the chances of Hungary's successful integration into evolving global trends, given that the emerging new industrial revolution requires particular cultural, intellectual and institutional preconditions.

Keywords: economic growth, economic security, macroeconomic imbalances, economic crisis, international liquidity, economic role of the state, Hungarian economic history, regime change

The issue of economic security in Hungary

Comments on matters of concept

Economic security (*gazdasági biztonság* in Hungarian) is not a generally accepted term in economics or, particularly, in common parlance. Primarily for historical, but also for linguistic and cultural, reasons, the term may carry different contents and cover a variety of areas, depending on the context in which it is used.[1] In academic literature and economic analyses it is used mainly in regard to the position of an individual or a business undertaking, in contexts such as product security, security of supply, employment security, the secure market position or secure equity position of a business firm, etc.[2]

The uncertainty concerning the meaning of the term stems from the fact that the society's particular experiences and challenges shape the context in which security aspects of the economy appear, and the context itself is also changing continuously, in response to rapid modifications in the economic and social circumstances. It is worth recalling what the US Secretary of State *George Marshall* said in the speech he delivered in June 1947 when launching what later came to be known as the *Marshall Plan*: the aid is to be provided to restore the *"normal economic health"* of the economies concerned and to revive a *"working economy"* in the fight against hunger, poverty, desperation and chaos.[3] Although *economic security* was not specifically mentioned in that speech, these keywords designated what the bolstering of the economic (and political as well as social) security of war-stricken countries meant in that particular historical situation.

Accordingly, the workability and the healthy functioning of the economy designate the desired target state, the opposite of which is *crisis, risk and threat*. The 1950s and 1960s saw rapid economic growth in both market economies and in countries based on central planning. After a while, however, *economic crisis signals* appeared, initially in market

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[1] Equivalents of this adjectival combination in various languages appear in Wikipedia with a remarkably wide variety of different content elements and depths of detail. The English version of Wiki offers the shortest description of *economic security,* approaching it primarily from the aspect of the individual's *job security* and from that of the individual's role in saving and in finance in general; at a national level it refers to energy security and international competitiveness. The French equivalent defines the term from the perspective of growing living standards and continuous development, also in a concise form. The German version is more detailed, focusing primarily on the financial equilibrium of the individual or the business. The Russian form *(ekonomicheskaya besopasnost)* is the most elaborated version of the term, comprising international liquidity, capability to assert geopolitical interests, and the stability of social and economic order. It should be noted that even an act of law has been adopted in Russia on national security *(O besopasnosty – Zakon RF,* 1992), setting out the concept and the content of the term national economic security in detail.

[2] The brief definition in the *Financial Times Lexicon* (applying, in principle, to both firms and states) refers to the threat of sudden disruption of economic processes and the efforts made at preventing and avoiding such threats, noting, by way of an example, complications caused by stock market manipulations or attacks against currencies.

[3] *"It is logical that the United States should do whatever it is able to do to assist in the return of normal economic health in the world, without which there can be no political stability and assured peace. Our policy is directed not against any county or doctrine but against hunger, poverty, desperation and chaos. Its purpose should be the revival of a working economy in the world as to permit the emergence of political and social conditions in which free institutions can exist."*
See: www.oecd.org.general/themarshallplanspeechatharvarduniversity5june1947.htm

economies, going far beyond the scope of a sector or region. It was in the early 1970s, the years of a sudden price increase and *energy supply* insecurities caused by the first oil crisis, when the societies of the developed world had to realize that the post-war rapid economic growth could not be taken for granted. Far from that: events emanating from key industries, such as the energy sector, may cause shocks to the society as a whole. The industrialized world underwent a process of *economic restructuring* which entailed a series of sectoral, regional, employment and macroeconomic crises.[4]

The *Hungarian People's Republic* was also much affected by the oil crises that shook (and awakened) the western economies, no matter how this was officially refuted and how promises to the contrary were made. Due to the characteristics of its economic structure, its geopolitical status and social policy determinations, the Communist regime proved to be slow to respond to global changes.

It was the *world of finance* that came to be most heavily affected during the next decade, the 1980s, primarily in the developing world, but also in some of the planned economies, such as the socialist *Romania* and the *Polish People's Republic*.[5] All too frequently states went bankrupt with major spillover effects, showing how financial disequilibria could lead to crises affecting the whole society of the country concerned.[6] Hungary learned painful lessons in this aspect as well and it was only by joining international financial organizations in 1981–1982 that the socialist party leadership managed to avoid Hungary's external default. This, however, meant the acceptance of restrictions entailed by IMF membership and compliance with the terms and conditions of borrowing.

Hungary's economic security was hit hard by the *disintegration of the planned economy* and the wave of crises that came in its wake. Hungary was not the only country to face such difficulties, as all other countries in the Central and Eastern European (CEE) region sank into a *crisis affecting the entire social and economic regime* in 1989–1992. The transformation of the political regime was accompanied by an economic downturn of a scale not usually occurring in peace time. Hungary's gross domestic product (GDP) dropped by about 18% during the years of transformation recession (1990–1993). This was comparable to the loss of GDP in Poland and the Czech Republic; economic contraction in Russia, Ukraine and other former Soviet states turned out to be even much deeper (Blejer–Coricelli, 1997).

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[4] From the aspect of our topic it is worth quoting what Joseph Schumpeter had to say on the nature of capitalism in a chapter of his book discussing *creative destruction: "Capitalism [...] is by nature a form or method of economic change and not only never is, but never can be stationary* (Schumpeter, 1942/1975): 82. In other words: change in itself – even if it is of an extent amounting to a crisis – is not the manifestation of defects of the market economy occurring from time to time, but is part of its very nature.

[5] Although Romania managed to pay off its foreign exchange debt by 1988, the forced repayment lead to disastrous economic and social consequences. Poland saw the outbreak of a domestic political crisis in 1980 and the Polish state quickly lost its international liquidity, for the third time in the country's 20th century history (1936, 1940 and 1981). The financial failure made life even worse in Poland: the standards of living plummeted, hundreds of thousands were forced to resort to international barter trade (as reflected by the proliferation of "Polish markets" in Hungary). It was only after a successful regime change that authorities managed to come to agreements with official lenders (1991) and later with private lenders (1993), on the terms and conditions of rescheduling. Until then, private capital looked upon Poland with reservations, the bulk of foreign funding came from the IMF, with economic policy conditions attached. Private capital flows steered clear of impoverished Romania for quite some time even after the collapse of the Communist regime.

[6] Alexandre Lámfalussy provided a detailed and extensive overview of the financial crisis in the developing world in the eighties and that of Russia in 1998 (Lámfalussy, 2008).

Social and economic transformation was inevitably accompanied by weakened *social security* (including growing unemployment, inflation and income inequalities) in all countries concerned, together with *regional* and *sectoral crises*. The size and dynamics of shocks, however, varied by country and by region; national economies responded to the new situation in a variety of ways. The shock-resistance and adaptive capacity of the Hungarian economy should be compared to countries in similar situations, facing similar challenges. In this regard *Hungary was among the best performing countries during the first decade of the new economic and political regime.*

The 1990s was a decade of rapid economic growth in most developed countries, with a growing sense of security at a global scale; core countries went unaffected by major shocks. The transformation of the transition countries, however, took a lot longer than expected. It took nearly a whole decade even for the most successful countries (the Czech Republic, Poland and Hungary) to reach their respective pre-crisis levels of GDP. Other countries faced even more severe economic and social complications in the course of transition from the centrally planned economic regimes.[7] Losses and damages caused by fraud and organized crime mounted; none of the countries concerned managed to avoid shocks originating from the financial sector, as a consequence of inadequate state supervision, the lack of experience of office holders, and of deficiencies in the institutional system.

An apparently carefree phase, promising predictable conditions, started in the early 2000s in the developed world and its peripheries – this period came to be termed later the *Great Moderation*. Year 2008 was, however, marked the outbreak of another financial crisis, with consequences reaching far beyond the world of finance. The standing of global capitalism that had been regarded as unshakeable up to that point, suffered a major blow. Since the weaknesses and deficiencies of state regulation and supervision are regarded as some of the key factors that triggered the crisis, the authorities' crisis prevention and macro-prudential activities suddenly gained importance and *governments became more active* in general.

In addition to the direct shock affecting the lending sector, the problems of *data security*, food security and the *climate change* also reached strategic levels: the advanced regions had to face a growing number of systemic risk factors. *Economy espionage* and *economic crime* are challenges no country is immune to.

Even cases amounting to *state failure* were witnessed in regions outside the developed world. In the light of these events and trends the measurement of *political risk* and its possible methods become all the more important. *State fragility* – caused by radical climate change, migration, disastrous food scarcities and/or other social and economic occurrences – became a specific research subject (Fund for Peace, 2015). The methodologies of state fragility will be utilized in this paper as well.[8]

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[7] For example, in Albania a pyramid scheme of fraud involving funds and assets worth nearly half of the country's GDP in 1996–1997 caused a major crisis, almost ending up in complete anarchy, cost the lives of some 2000 people (Jarvis, 1999).

[8] Out of a total of 178 countries Hungary is in the reassuring 141st place between Costa Rica and Latvia in Fund for Peace's list of states by fragility. This is the second best group, including Slovakia, Argentina, Italy, Latvia, Spain and even the USA, Japan and Germany. The least fragile group (ranked last in the list) includes, besides the Scandinavian countries, Austria, the Netherlands, Ireland, Switzerland and Australia. The list is put together on the basis of the following factors: demographic tensions, refugee issues, grievances of social groups, emigration, development inequalities, poverty and economic backwardness, the legitimacy of the

Content elements of economic security

This brief overview shows how any given society and its leaders have to face a wide variety of economic risks and/or threats affecting the economy even within relatively brief periods of time. It is for the very reason of the quick dynamics of social and economic processes and the variability of different types of threats that we do not attempt here to present a comprehensive definition of economic security. Suffice it to clarify, for a start, that we are going to discuss not risks affecting individuals' lives, financial, business or technical risks facing business entities or operational uncertainties of sectors or specific fields but threats appearing at the *level of the national economy* as a whole.

Our analysis is focused on the operation of the *Hungarian* society and economy. We are going to scrutinize factors relating to the economic aspects of the continuation and development of the *social and economic order.* Emphasis is laid here on potential risk factors and process contingencies, therefore this analysis is more risk aware and critical than would be a description of a desirable economic growth path or of a *"best case"* scenario. The degree of Hungary's economic security is not to be assessed against some abstract and general benchmark; what really matters is the country's position in *international ranking orders and comparative scales.* The strategic question is *how fully the Hungarian economy and society is capable of adapting to crises, disruptions and shocks; in what condition Hungary's economy appears to be from the perspective of possible risks.* A variety of normative conclusions can be drawn and recommendations can be made on the basis of the analysis.

The conventional analysis of the relationship between security and economy focuses on what *financial and other resources* a given economy can permanently dedicate to defence and law enforcement, that is, to what extent is the achievement of the state's security policy goals supported by the country's *economic power.*[9] The interactions between "economic muscle" and aspirations for power are extensively discussed in literature, with a special focus on the sustainability of the international balance of (the great) powers, along with dilemmas of the rise and fall of powers (Olson, 1982; Kennedy, 1989). The following analysis of the Hungarian economy also covers this nexus in discussing the size and structure of the general government budget, together with issues of public finances, but its main focal points lie elsewhere. This is because this conventional economy/security relationship is more valid at the levels of the European Union and NATO than for a member state. In the case of smaller countries that qualify as "dependent" in terms of security policy (such as Hungary), and countries that do not have global aspirations of their own, adequate national economic performance is required primarily for *maintaining the political system, guaranteeing social security and predictable functioning of society as a whole.* Accordingly, the effectiveness of the economy may be assessed primarily from the aspect of how these social goals are achieved.

A country lacking adequate economic performance may be weakened or even fail without any external conflict, as is proven by lessons drawn from economic and political history.

state, the standards of public services, respect of human rights, the security apparatus, divisions across elite groups, exposure to external intervention.

[9] Economic strength or economic power is a concept rarely used in economics, one that is difficult to measure, but it is, nonetheless an important factor without which no correct interpretation of processes can be given. See: Bod, 1995.

An overarching overview of the above is given by Acemoglu and Robinson: according to their argument, economic success or failure hinges primarily on cooperation involving all components of society; success is based on an *inclusive* political institution system, while failure is a result of an *extractive* type of system (Acemoglu–Robinson, 2012). The type of the political institutional regime is a key starting-point because the authors associate economic power not with the abundance of natural resources, favourable geographical locations, amount of capital available in an economy, or any other macroeconomic variable but derive economic conclusions from the *social conditions.*

The state of the fundamental social institutions being a causal variable in terms of the success of an economy is not an entirely new assertion. The critical importance of *level of development of the division of labour* and of the *exchange of activities (exchange of goods, trade, finances)* has been discussed extensively in literature on economic growth and welfare since the epoch-making work by *Adam Smith (The wealth of nations)* (Smith, 1776/1992).[10]

The connection between the strength of the economy and the security of the nation is crucial in both directions. On the one hand, when economic growth stops or even if it slows down somewhat, internal social tensions may soon start to intensify and the state's international power positions may start weakening. The strength of an economy and, consequently, the level of material welfare, are the sources of *political legitimacy*, in addition to their direct contribution to social peace and social stability. The performance of the economy plays an important role in the state's external relations as well: indirectly through strengthening *international prestige,* while directly through the *financial and material contribution* to the security alliance systems. On the other hand, social stability and a solid legal system, and a country's ability to assert its interests at an international level, are critically necessary for a country that is not rich in raw materials to be able to develop and maintain a competitive, up-to-date economy that can guarantee high living standards.

Based on these considerations and in view of Hungary's conditions, we will discuss the following important components of economic security:

- the trend of economic growth, its sustainable rate and the economy's natural growth rate;
- the state and structure of the budget, and the modalities and costs of its financing;
- international credibility and its perception; the external balance of the national economy, the size and structure of its debt;
- the efficiency and transparency of the government sector;
- the stability of the economic order (the functioning of the legal system, compliance, economic integrity, the condition of the state-business and state-citizen relations);
- the effectiveness of asserting the interests of the national economy;
- the dependence of business cycle on external factors;
- the vulnerability of the economy, growth risk factors;
- the economy's international competitiveness and its factors;

[10] Accordingly, protagonists of the modern growth theory regard the *institutional factor* of economic performance to *be on equal footing* with the conventional *factors of production* (capital, labour). In the existing world order the "wealth of nations" depends less on the availability of capital, labour, arable land or raw materials in general: endogenous factors, such as the state and condition of institutions, the social structure, the technological level, the market structure, the state and condition of the financial and physical infrastructure or the order of conflict management are much more dominant in this regard today.

- characteristics of income and wealth conditions, inequalities and their trends;
- the condition of the system of economic values, economic knowledge and capabilities;
- trends and outlooks of the availability and supply of factors of production.

In varying forms and to varying degrees each of these groups of factors contributes to the perceptions and judgements of the state and outlooks of national economic security; however, they cannot be reassuringly condensed into a particular indicator or grade.[11] It is not without good reason that the title refers to *security of the nation*: our topic involves more than the investors' security or an assessment of financial creditworthiness. Our aim is to assess, in their complexity, the social risks and uncertainties stemming from or intermediated by the economy.

The comparative concept of economic security

In an environment of a high degree of external economic, information and cultural openness a halt or even a relative decline in economic growth rate compared to the competitors may have an immediate impact on the society and economic actors. Consequently, an economic analysis should not only or not primarily focus on how the given economy is doing *in comparison with its past track record* in terms of growth and equilibrium, but how it is doing in the relevant framework of reference.

However, it is seldom self-evident which country or region counts as *relevant* in international comparison. A neighbouring country or region, or one that is geographically close, is, of course, usually more relevant than those at greater distances. Of the possible comparators those are of relevance to security that play a role in practical economic decisions taken by the members of the given society, its businesses and capital owners. In the case of Hungary, *Austria, Germany and the Visegrád four (V4) countries* are, for historical reasons, natural comparators, while other neighbouring countries *(Serbia, Romania and Ukraine)* are not included in the conventionally applied framework.[12]

The framework of comparison has a *subjective* element as well (different societies or countries for different people), but from the aspect of economic security the most important question is which comparison has an actual impact on actions of economic participants (employees, savers, businesses, consumers) and on those of political and economic decision makers. For example, insufficient income in the domestic labour market related to wages offered in benchmark countries may lead to the emigration of mobile labour force; unfavourable domestic tax regulations relative to those of countries known as alternatives for operations may trigger capital flight. Such cases illustrate that what we are talking about is not only subjective perceptions and feelings or matters of national prestige; they are true economic motivators.

[11] Political risk index or the *rating* assigned by by international credit rating institutions are examples for this but these are worked out as required for their own specific concrete purposes.

[12] However, the framework changes from time to time: as a consequence of wage increases in Romania or the impulses coming from the labour market south of Hungary the actual frameworks of comparison used by a proportion of Hungarian families may be supplemented with Hungary's southern neighbour.

Also of importance is how major international players perceive and classify a given country. Let us consider the grouping of countries to which Hungary belongs in the eyes of important institutions. At present Hungary, together with the other three Visegrád countries, is listed as a *developed* country in the official *UN* nomenclature.[13] The *International Monetary Fund* registers Hungary (and Poland) as part of the *developing world (emerging market and developing economy)*, while it has assigned the Czech Republic and Slovakia to its *advanced* category.[14] In the categorization system adopted by the *World Bank* Hungary and the other V4 countries belong to the *upper* income category *(high income)*.[15] The situation is different when it comes to the *OECD,* where Hungary belongs to the *medium* income category while the other three are assigned to the high income category.[16] Business analysts, as well as investment banking and capital market experts often refer to Hungary as belonging to the *emerging market* category, which is, of course better than belonging to the developing world but indicates a higher degree of risks than does the category of developed countries. In the EU configuration Hungary is part of the *outside the euro zone* and *inside the Schengen zone* sub-groups.

Keeping the *national currency is said to* give an extra economic policy tool to a government which may, ideally, be used as a means of protection against external shocks through a suitable exchange rate policy. At the same time, a national currency, which is globally marginal may in itself become the subject of speculation and any major exchange rate fluctuation is bound to increase business and macroeconomic risks.[17]

The economic importance of Hungary's membership of the European Union is hard to over-estimate. Accession has eased the integration of Hungarian businesses in the production chains of large enterprises with their headquarters in Europe, has led to the settlement in Hungary of large manufacturing enterprises (mostly in the automotive and electronics industries), and to the development of a sizeable logistics sector. All of these businesses require uninterrupted and quick access to the main markets; the two main components of easy access are good physical infrastructure and goods being granted crossing the state borders without border control formalities. Consequently, losing the *Schengen area status* would be a major risk factor, particularly with the automotive industry being a dominant element of Hungary's industry structure.

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[13] www.un.org/en/development/desa/policy/wesp/wesp_current/2014wesp_country_classification.pdf

[14] www.imf.org/external/pubs/ft/weo/2016/01/weodata/weoselagr.aspx#a110

[15] https://datahelpdesk.worldbank.org/knowledgebase/articles/906519

[16] www.oecd.org/trade/xcred/2015-ctryclass-as-of-16-july-2015.pdf

[17] A variety of in-depth research projects were carried out concerning the pre-requisites for the introduction of the euro and its potential advantages and disadvantages in the early 2000s when Hungary was gearing up for EU membership. Researchers argued in favour of the adoption of the joint European currency, demonstrating its effects promoting economic growth. The first Orbán government was preparing for an early adoption of the euro. A new analysis was brought out (Neményi–Oblath, 2012) in the wake of the financial crisis of 2008, taking into account the changes and developments that had taken place, and an extensive professional debate unfolded in an economic periodical *(Közgazdasági Szemle)* with the participation of experts as Gábor Békés, Péter Ákos Bod, Lajos Bokros, László Csaba, Tamás Mellár, Palánkai Tibor and others. The timeliness of opinions cautiously arguing in favour of the introduction of the euro was weakened by the fact that Hungary was not meeting the majority of the accession criteria, and particularly, by an apparent lack of political support of the adoption of the euro. By July 2016 Hungary did meet the critical indicators and the minister in charge of the national economy even declared that by 2020 Hungary could join the euro zone. Nonetheless, the government in office does not seem to have the political will.

How institutions perceive a country's level of development has a strategic aspect. This aspect is whether the given country (in this case: Hungary) is a developed market economy or, to use a concept that stems from development economics literature but is used extensively nonetheless, whether Hungary is a *core country*. The majority of Hungary's economic indicators, confirmed by the above country classifications, define *Hungary* to be, at the beginning of the 21st century, *in a transitory position between the developed world and the peripheries of the European core.* Belonging to the European periphery is, of course, not the same as being in the global *periphery that is in the developing world.* It is also remarkable that certain classification schemes reviewed above assign some of the peer countries in the CEE region to a higher category. For this reason, the analysis of the Hungarian economy's risk and load bearing capacity and Hungary's financial/economic strength will have to specifically discuss changes in Hungary's position relative to the *V4 group.*

Particular attention must be paid in examining economic security conditions to the *financial aspects,* in view of the relevant historical preliminaries. The reason for this is that economic processes frequently overrun in the peripheries, causing capital market "bubbles" to develop, leading to financial panic. Other processes may also develop rapid dynamics: excessive agglomeration effects may be triggered, and energy dependence as well as import/export market dependence may reach levels that may be considered as also excessive. Waves of economically or politically motivated emigration may also develop rapidly and their effects may destabilize the state concerned.

In the age of global interdependence no nation state – particularly those in the peripheries – has sufficient control mechanisms for the management of such possible economic shocks. Once unfolded, the effective management of a financial crisis requires a high level of *confidence in the government's integrity and the legal system;* this is why the situation of social values and trust as capital also need to be analyzed.

Hungarian economy: conditions, opportunities, risks

Hungary's economy has encountered many a crises – but have we learned our lessons?

Before applying the key economic security indicators to Hungary's current conditions and circumstances, it is important to discuss antecedents and the heritage from the past. One of these is that periods of continuous and unbroken economic development were brief and rare in Hungarian history. The legal and institutional framework has been changed all too frequently in recent decades for achieving capital accumulation, growth in economic strength, build-up of wealth and organic societal development, as has been customarily in much of the developed world.

Even in the rare cases when household consumption could grow continuously at long last, destabilising processes lurked behind the impressive statistics. Like in the 1960s and 1970s: *the relative welfare under the Kádár regime was accompanied by the build-up of an immense external sovereign debt.* Incidentally, the other reformed centrally planned economies shared the same fate – see the similar story of how Poland and Yugoslavia became heavily indebted. Debt accumulation is, at the same time, a form of raising funds

from abroad, therefore the same process may be viewed from a different angle: while borrowing was used for the maintenance of the political regime, but the accumulation of debt may also be regarded as a process accompanying the inevitable opening of the economy, and modernization driven by capital imports.[18]

Its consequences, however, were clear and beyond doubt: the foreign exchange debt inherited from the Kádár regime aggravated the initial, and conflict-ridden, process of the *political regime change*. It took a long time before democratic Hungary's external debt and domestic general government debt decreased back to an acceptable level: by 2001 the government debt to GDP ratio (52%) was the only Maastricht criterion Hungary could meet. By that time the external foreign exchange debt had ceased to be a strategic risk factor, primarily as a result of the massive influx of non debt-creating *foreign direct investment (FDI).*

The historical lessons learned did not make a difference in the world of politics, however. The *"excessive consumption – government debt increase – external indebtedness"* cycle was run repeatedly in Hungary in the early 2000s. Although only temporarily, the process boosted the growth of GDP over the potential rate of growth through a demand side impetus. It has to be pointed out in this regard: a dynamic increase in economic performance measured in terms of the conventionally applied indicators of economic output (GDP, GNI), indeed, an upswing in consumption and living standards, can only contribute to social stability if growth is achieved at the expense of a significant and permanent loss of *economic equilibrium*. Therefore, in addition to factual data, account will have to be taken, from this point, of the level of and changes in the *natural growth capacity*, that would have existed, or would exist, without any forced intervention, external indebtedness and excessive exploitation of natural and human resources.

Another comment on social perception of economic processes: the so-called objective processes are perceived and evaluated by different social groups in different ways. Their behaviour is also affected by their *subjective expectations*. At the historic moment, in 1990, the majority of the Hungarian society did not regard the averting of the impending financial crisis to be the most important thing: instead, people were hoping, once four decades of seclusion from the West ended, that their living standards would reach, or at least start raising towards, those prevailing in the West (namely, in Austria and Germany). Yet it was the very historic moment at which Hungary's relative economic performance sank to the greatest ever distance from that of Austria (See table 1).

[18] In regard to the debt crisis which came to a head at the time of the regime change Ottó Hieronymi had the following to say: "Like in the case of a number of other heavily indebted countries Hungary's accumulation of such massive foreign debts and such heavy debt servicing burdens were a combined result of a variety of internal economic policy mistakes, as well as international trends. The seventies were characterized by excessive borrowing – for the most part in order to raise living standards, and to compensate Hungary's delaying, for long years – like the other socialist countries – changes in the structure of production and consumption that would have had to be carried out in the global economic situation that came about after the first oil crisis" (Hieronymi, 1990).

Table 1

Hungary's economic development compared with that of Austria (GDP/capita; Austria = 100)

1890	1913	1938	1960	1970	1980	1990	2005
60.3	60.5	74.6	56	51.6	45.9	38.2	40.1

Source: Tomka, 2011

Excessive subjective expectations on the one hand, and slowly changing economic, financial and technological conditions and circumstances on the other hand: not surprisingly, the tension between the two leads to conflicts. This was what happened in the case under review: political public opinion and voters' sentiment quickly turned against the political powers that had won the elections not long before. One of the well-known peaks of the tensions was the so-called *taxi drivers' blockade* in October 1990, which was triggered by reasons linked to the preceding political regime (inadequate national oil reserves, the fact that domestic energy prices had been kept below the world market prices, that people had precious little in the way of financial reserves), dramatic changes in the external environment (soaring international oil prices, inadequate willingness and capability on the part of the Soviet Union to supply oil) and the new government's lack of practical experience in crisis management (Kodolányi, 2016).

The energy crisis in 1990 also indicated that, unlike western economies, socialist countries (including Hungary) had failed to implement economic, price policy and technological measures and actions in the wake of the global oil crisis of 1973 that could have created less energy-intensive economic structures. The majority of these problems too were bequeathed by the centrally planned economy to the regime changing society, just like issues relating to environmental loads and pollution.

The consequences of four decades of centrally planned economy are still with us today, for example in the *high energy intensity of the economy* of the EU member states, despite improvements that have taken place in each of the countries concerned through price mechanisms and structural changes. As indicated in Table 2, the amounts of energy required for turning out 1000 euros worth of gross domestic product still vary widely, despite all of the changes brought about by an entire decade after the regime change.

Table 2

Change in energy intensity between 2004 and 2014.

Country/year	2004	2008	2014	ei2014/ei2004
EU28	152.0	137.7	122.0	80%
Czech Republic	360.3	281.9	256.3	73%
Germany	142.6	126.6	114.4	80%
Greece	135.1	127.4	131.7	97%
Hungary	275.3	255.3	219.5	80%
Austria	123.3	113.9	106.2	86%
Poland	329.7	288.3	233.7	71%
Romania	375.1	293.0	235.0	63%
Slovakia	368.6	269.7	221.2	73%

Intensity ratio: Domestic energy consumption in oil equivalent, per 1000 euros of GDP .Last column: 2014 energy intensity as a percentage of the 2004 ratio

Source: The author's editing and calculations, based on Eurostat data

The data indicate that structural differences still exist among the economies concerned: the Czech and the Romanian economy are still using twice as much energy as the EU average, while Hungary's data are somewhat more favourable. The rates of improvement are also visible: during the period under review the EU economy reduced its energy consumption by about 20% of the initial level through technical development, energy prices being kept at high levels and through changes in the economic structure (conventional industries use immense amounts of energy, while high value added services use relatively less). The improvement achieved in Hungary is in line with the EU average, but, owing to the existing conditions, it is *not satisfactory*. In the long run, household tariff regulations that are dominated by political considerations counteract any effort or intent to improve energy efficiency, which is still unfavourable in view of the prevailing European ratios. Romania, Poland, Slovakia and the Czech Republic, however, have been making remarkably rapid improvements. Intensity data may be used as proxy for the environmental load as well as for the country's *energy dependence* in net energy-importing countries.

Mention should also be made in this regard of the attitude of economic policymakers toward the so-called *productive* and the *service providing* sectors which, from the aspect of the earlier Marxian dichotomy of productive v. non-productive, makes practically no sense in a market economy, yet it is still commonly held, and not only in Hungary. Negative feelings concerning services (primarily financial services) grew stronger as a result of the crisis of 2008. The excessive growth of financialization and the rapid decline of conventional industries in the European peripheries (in Greece and Spain) really called for adjustments, but it would be amiss to return to obsolete concepts of what industry is. In Hungary, where the share of industry in total output is significantly larger than the EU average, general re-industrialization would make no economic sense. What is all the more important, however, is to increase the value added content, regardless of whether it is generated by production or – which is more realistic – by service provision. Another security aspect of relevance

to our discussion is that assembling and manufacturing processes are significantly more energy intensive than are the majority of the services that add to the utility and market price of products (R&D, quality assurance, logistics, and other business services).

Energy crises are only one among the many macroeconomic risk factors. Other dangers have also emerged along the Hungarian economic and social path, primarily in financial relationships. After the above mentioned period of growing indebtedness around 1980, the threat of default on external debt emerged at the end of 1989; and then again in the autumn of 2008 when international disorders shook financially vulnerable economies. Since these periods have been analyzed extensively, it only needs to be noted here that the amounts and ratios of the *external debt* and the *public debt*, as well as *access to capital markets,* are risk factors on which more emphasis needs to be laid in the discussion of Hungary's economic security than in the case of other, less indebted, nations of this region.

The economy's growth capacity

Growth is a central element of any macroeconomic analysis: the value added that is generated by an economy is the source of earned income and of the profits of businesses. Public revenues of the budget of a state are generated mainly through deduction by the state from such primary forms of income. The fact of growth, indeed, even a high rate of growth, does not, in itself, rule out economic and social risks, if growth is accompanied by increasing external imbalances or domestic inequalities, or economic and financial discrepancies. Therefore, after outlining a general picture, risk elements need to be discussed in particular, with an emphasis on how Hungary's growth rate responds to external shocks.

A longer time series of data on changes in Hungary's gross domestic product (Figure 1) provides a "bird's eye view" of the quarter of the century that has passed since the regime change: they show the dramatic decrease following the basis year of 1990, the subsequent relatively rapid growth, the slump following the financial crisis that broke out in the autumn of 2008 and the growth path with periods of set-backs, during the recent years.

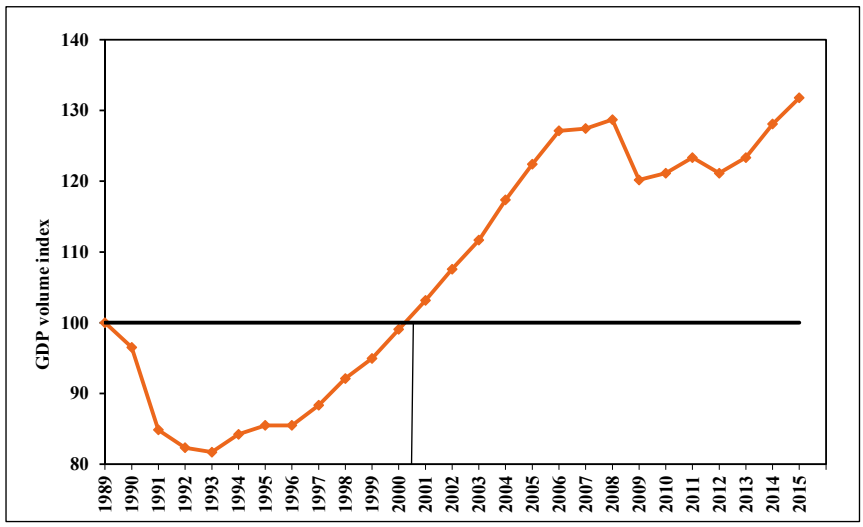

Figure 1

Hungary's GDP (1990 = 100%)

Source: Eurostat

It is worth, however, comparing *Hungarian data* to those of the relevant peer countries – including, primarily, former centrally planned economies of the Central-European region. Hungary's performance does not look convincing if compared to the performance of the comparable countries.

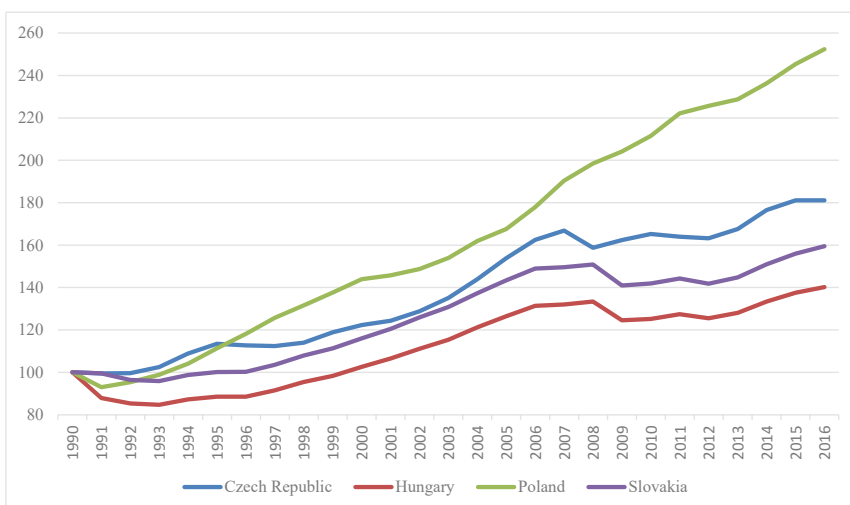

Figure 2

Real GDP figures in the Visegrad 4 group

Source: Own calculation based on IMF data

A quarter of a century's growth data show that *the other Visegrád countries produced better growth figures than did Hungary,* despite the similar initial levels of development and the past and present similarity of the relevant external conditions.[19] On the other hand, some of the other countries in which the political and economic regime was also changed suffered even more serious initial set-backs and then covered recovery paths different from those of Hungary. For example, the three neighbouring former Yugoslavian states took a starkly different course of development. Countries followed very different paths in the region, primarily after the 2008 crisis. For this reason, growth performance of different countries in recent years need to be discussed separately.

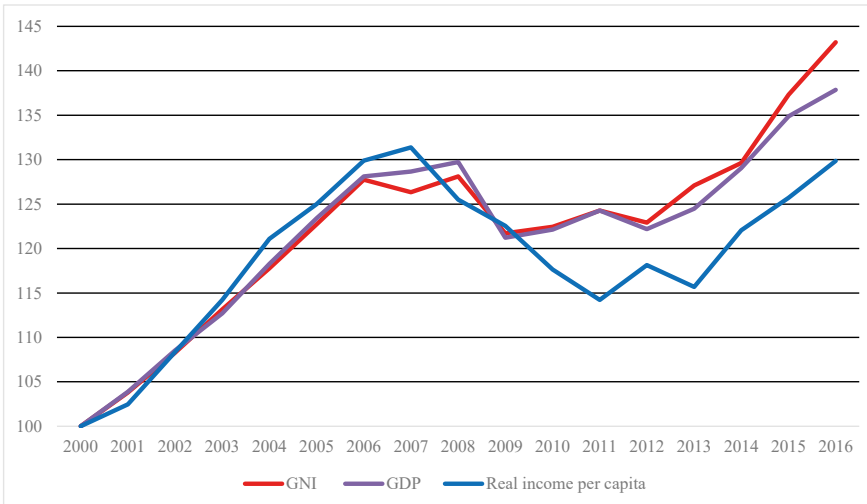

Figure 3

GDP, GNI and real income per capita in Hungary

Source: Calculation based on Central Statistical Office data

Figure 3, showing data for a shorter period of time, indicates the immediate dramatic effects of the crisis hitting Hungary in the autumn of 2008. It is also clear from the figure that Hungary's economy was not on a dynamic growth path even right before the slump of 2009. In fact the growth of the economy suddenly slowed down from the autumn of 2006 when – in response to the European Union's pressure – efforts started to be made to reduce the alarming rates of budget deficit. It is also clear that, as in the case of the crisis in the early 1990s that followed the regime change, a *sudden contraction was followed by slow and protracted recovery*. It was not until the end of 2014 that Hungary's GDP crawled back to the 2007 level: it took five years for the economy to recover from the slump of 2009. This economic performance was fairly close to the EU average but fell short of those produced by more dynamic nations of our region, including primarily Poland, Slovakia and Romania.

[19] Hungarian literature on economics took note of the importance of regional comparison. Oblath explains Hungary's relatively lower performance compared to those of the other three V4 countries with the higher degree of macroeconomic instability of the Hungarian economy Oblath, 2014).

What we have been discussing so far is, however, the GDP, the indicator of the value added that is produced in the territory of Hungary. A look at the rate of *gross national income* (GNI), which includes the income of residents in Hungary, shows that at the end of the period under review its dynamics perceptibly outperformed the growth of GDP, the most frequently cited indicator of economic performance. The faster growth of the GNI was driven by two key factors: the increase in the *EU transfers* and in the repatriation *transfers of those employed abroad*. Future changes in these underlying factors are regarded as a major risk factor of Hungarian national income.

The above macro-indicators provide valuable insight into economic performance but they are far from what people feel and see. Changes in the *real income* of people however, are of relevance to understanding the financial circumstances of the majority of the population who live from wages and salaries. Real incomes, which reached a peak before the financial crisis, also shrank rapidly but the process of their recovery appeared to be even more difficult to get started, and was even more delayed than that of the GDP and GNI: they had not reached their (not particularly high) year 2007 level even by 2015.

Meanwhile *income inequalities* grew considerably among households in Hungary: the poorest fifth and the most affluent fifth of the population earned 9.6% and 35.5% of the total income, respectively in 2007, while the corresponding figures were down at 8.6% and up at 37.5%, respectively, by 2014 (BCE, 2016). As a consequence of changes in income distribution in 2016 *more than half of the Hungarian population was still living on incomes lower than in 2006.*

More long term macroeconomic data show that the performance of the Hungarian economy during the recent somewhat longer period of time was rather short of remarkable. *After the passing of a quarter of a century Hungary's GDP exceeded the level recorded at the time of the collapse of the previous political system in 1990 by about 30% and even by 2014 it only managed to crawl back to the level measured in 2008.* This performance is not something to be proud about in the Central-European region. The 1.0-1.5% average annual growth rate achieved during the period under review makes convergence to the West – viewed as a historical basis of reference – practically impossible to achieve.

On the other hand, however, the *last years* of the series of data presented above show a significantly more positive picture in terms of growth, with GDP growth rates around or over 3% and with improving equilibrium indicators. On the basis of the more recent data one could even argue that the earlier crisis-ridden period has come to an end and the economy of Hungary is now making headway on a *growth path,* as is actually declared in convergence reports published by the government (Magyarország Kormánya, 2016).

Indeed, calculations produced by a variety of research and other institutions indicate an acceleration in Hungary's so-called *natural growth rate,* supporting positive expectations.[20] Calculations of independent sources, however, show that even the increased natural growth rate is only about *2 percent.* On the one hand, this is still below the dynamics featured by other V4 countries, and, even more importantly, it *pushes the vision of approaching the Austrian and German levels of development into such a remote future* that is beyond reach for political decision-makers.

[20] On the possible sustainable economic growth rate of the Hungarian economy see: Bod, 2016.

The estimated natural growth rate is the result of calculations that depend on the parameters of the available factors of production (labour, capital) and the projected effectiveness and efficiency of the political institution system and legal regime. The calculated value is therefore affected by factors whose changes have a direct bearing on economic order and security. These components will be discussed in more detail later on.

The general government system as a stabilising institution that carries risks as well

The Hungarian state is a key participant of the economy: redistributed primary incomes amount to about half of the total GDP in Hungary The same ratio was even higher during the period of the centrally planned economy; high rates of centralization were, however, regarded at that time as a natural feature of the Communist socio-economic system, as a consequence of the small proportion of the underdeveloped and dispreferred private sector, the dominance of state ownership and the hierarchic organization of the economy.

Most of the former centrally planned economies disposed of the majority state ownership first during the process of regime change in the early 1990s, by applying techniques of privatization and economic policy instruments stimulating the private sector, and then they built up a system with significantly lower rates of *centralization* and *redistribution*. The general government system was most rapidly downscaled primarily in the countries where income and wealth conditions that had evolved during the decades of socialism were rearranged by *high inflation rates* (Poland and Romania), or where there was a strong intent to achieve adaptation to the conditions and circumstances of market economies in the course of *state building* (primarily in the Baltic states, and Slovakia after the removal of the Mečiar government).

By contrast, transformation in Hungary was – despite all of the microeconomic shocks and those affecting the economic structure – a fairly *gradual* process in this (and only in this) regard. In terms of its redistribution and income centralization rates Hungary's indicators are more similar to those of the affluent Western and Northern European welfare states than to those of its regional competitors of similar levels of development.

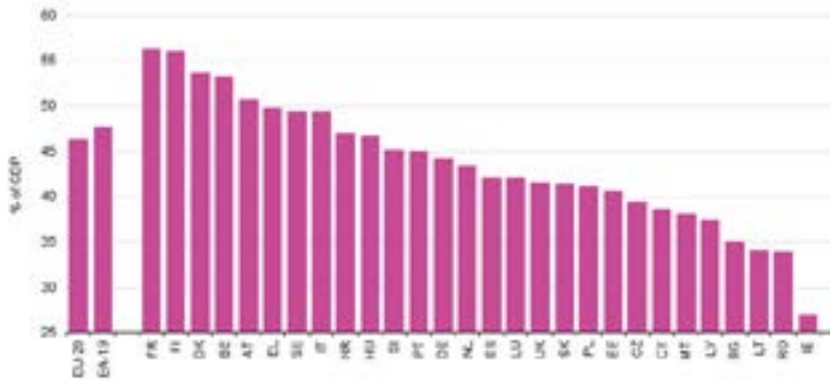

Figure 4

Relative size of budget in Europe: Total general budget expenditures as per cent of GDP

Source: Eurostat

The overbearing presence of the state may impede economic performance and increase the risk of state bureaucracy failing to use the centralized funds effectively and efficiently enough. The heavy dependence on centralization and allocation by the state increases the dependence of households and businesses from *politics* and their exposure to political changes, together with the regulatory risks inherent in the operation and functioning of the private sector.

At the same time, redistribution ratios that are higher even than those observed in Hungary, can be found in affluent European welfare states, where they do not interfere with economic competitiveness. In those countries however, businesses and households have, through long decades of organic development, got accustomed to extensive central redistribution and the associated high tax rates, while social control institutions are highly effective in guaranteeing that public monies are used in a transparent and reasonable way. The preconditions of transparent use of public funds are, however, not met in Hungary, certainly not meeting Scandinavian or German standards.

It is more difficult to keep an oversized general government system in balance than would be with lower tax rates and a smaller expenditure side, although the *deficit bias* is primarily due to institutional and political factors. From the aspect of economic security the high rate of governmental debt relative to GDP is not, in itself, a critical factor (the Belgian and the Japanese government debt ratios are, for instance, many times over the rates that would, in the case of developing or transition countries, be a source of major concerns). What is highly important is the *way debt financing* is taken care of: the risk of renewal is smaller in the case of debt in a country's own currency, financed primarily by domestic income owners.

The government debt turns into a major security risk factor when the general government debt is accompanied by *indebtedness of the private sector,* particularly when twin deficit appears: besides the general government deficit the current balance also shows a major deficit and both types of deficit begins to build up a hefty debt portfolio. Hungary's government debt ratio rapidly deteriorated in the early 2000s, while during the second part of the period under review it started to gradually improve (Figure 5).

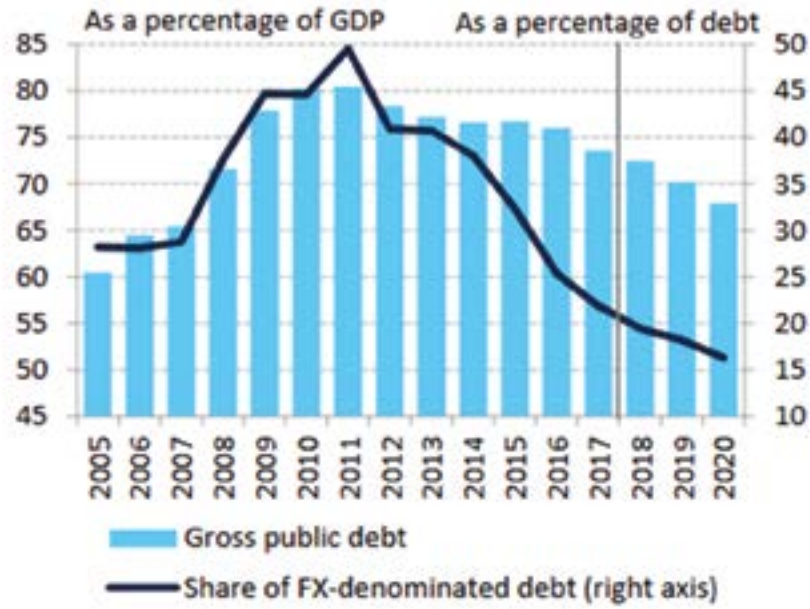

Figure 5

Gross public debt forecast calculated with unchanged (end-of-2017) exchange rate over the forecast horizon

Source: MNB: Inflation report. June 2018.

Actual data up to 2017 show that the consolidated government debt dropped to below 75% relative to GDP and, in accordance with statutory regulations, this ratio is continuously diminishing; this ratio is just below that of the EU average. Foreign exchange exposure is expected to keep decreasing considerably before it reaches the level recorded in the early 2000s. But to assess Hungary's external foreign exchange dependence, one must look at the *position of the entire Hungarian economy:* in this respect the improvement since 2012 has been even more spectacular.

As for the favourable indicators of the government debt portfolio and the annual budget deficits, reference needs to be made to the changes that have occurred in the *pension system,* which is also part of the general government system. The mandatory private pension fund, the third pillar of the pension system, was discontinued after 2010. Most of the members were directed back into the state pension system, while their pension fund savings were absorbed by the state. This then reduced the stock of official (explicit) government debt. Since then, however, those retiring may only hope to be paid public pensions from the contributions to be paid by the active generations coming after them. In other words, the corresponding amount of future claims should be added to the so-called *implicit* (not contractual) *government debt,* that is, the stock of debt that the Hungarian state owes as political and ethical (but not contractual) obligation to those paying pension contributions today. *In the all too well known demographic situation the existence and, in particular, the growth, of the implicit debt is a long term budget risk factor.*

Mention must also be made in relation to the budget of the amounts dedicated by the budget acts to *defence and police capabilities*. Among expenditures according to the international functional nomenclature (Table 3) that the Hungarian state allocates 2.3-3.0% of the Hungarian GDP to these two functions.

Table 3

Defence and police expenditures in the Hungarian general government system, as a percentage of general government expenditure and GDP

COFOG		**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018p**
F02	Defence	2.4	2.0	2.0	1.7	1.6	1.4	1.6	1.7	1.8
F03.a	Administration of justice	1.1	1.0	1.0	0.9	0.9	0.7	0.9	0.9	0.9
F03.b	Public order and safety	2.7	2.5	2.7	2.4	2.4	2.3	2.1	2.4	2.7
F03.c	Fire protection	0.2	0.3	0.5	0.5	0.5	0.4	0.4	0.5	0.4
F03.d	Prisons	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.6
F03	Law enforcement and public safety	4.5	4.2	4.6	4.2	4.2	3.9	3.8	4.3	4.6
As a percentage of GDP (cash-basis)										
F02	Defence	0.9	0.8	0.8	0.8	0.7	0.7	087	0.8	0.9
F03	Law enforcement and public safety	1.7	1.7	1.9	1.9	1.9	2.0	2.2	2.1	2.2

Source: Calculated from data of budget Acts

Defence expenditures make up a small proportion of the above; Hungary had a relatively modest defence budget in the period surveyed, about half of the expectations regularly communicated by NATO. What follows from this fact is this is that funding will have to be found in the long run in the budget, which is already rather extensive, for considerably increased defence expenditures, assuming that NATO commitments cannot be postponed forever. Maintaining the defence capability inside the military alliance is still cost-effective compared to other options.

International financial relationships – fundraising, liquidity

Since during peace time recurrent accumulation of external debt has been the most significant *systemic risk* factor in Hungary's recent economic history, the *external indebtedness* of the economy (i.e. not only of the public sector) needs to be reviewed. Going back only to the early 2000s: the reckless budget policies pursued between 2001 and 2007 lead to the accumulation of a massive public debt. The macroeconomic risks were increased by *retail* borrowing, and the business sector (non-financial as well as financial enterprises) also built up massive debts expecting sustained high growth, and they did so primarily by borrowing from abroad, in foreign currencies. In this way the combination of the current account

balance and the capital balance ("external financing capacity") showed an immense deficit, equalling 7–8% of GDP for years before the 2008 crisis.

The unsustainable process was decelerated by the (belated) implementation of the actions triggered by the application of the EU's Stability and Growth Pact in 2006, by deploying the *excessive deficit procedure,* but the real turnover was brought about by the financial crisis that broke out in the autumn of 2008. The external deficit vanished on the turn of 2009 and 2010.

Since then, Hungarian data have shown a surplus – indeed, a massive surplus – which we will explore hereunder in a breakdown *by income owner.* The *state* continues to be in deficit but since 2013 its size has been smaller, *households* are net savers, as usual but the most profound change has taken place in the *corporate* category, whose position has turned from net borrowing before the crisis, into a net financing position. These processes have led to the unusual situation in which domestic participants were spending significantly less than their total income; the difference is being used by the Hungarian economy for *financing the outside world* and *reducing its existing debt portfolio.* This turn of events may be viewed from two angles: the turn-around of the process of external debt accumulation reduces Hungary's external financial exposure and its dependence on private and official lenders – this increases the level of economic security. But in a country that has always been short of capital it is not a logical option to export capital and it cannot be continued in the long term without a loss of its growth potential.

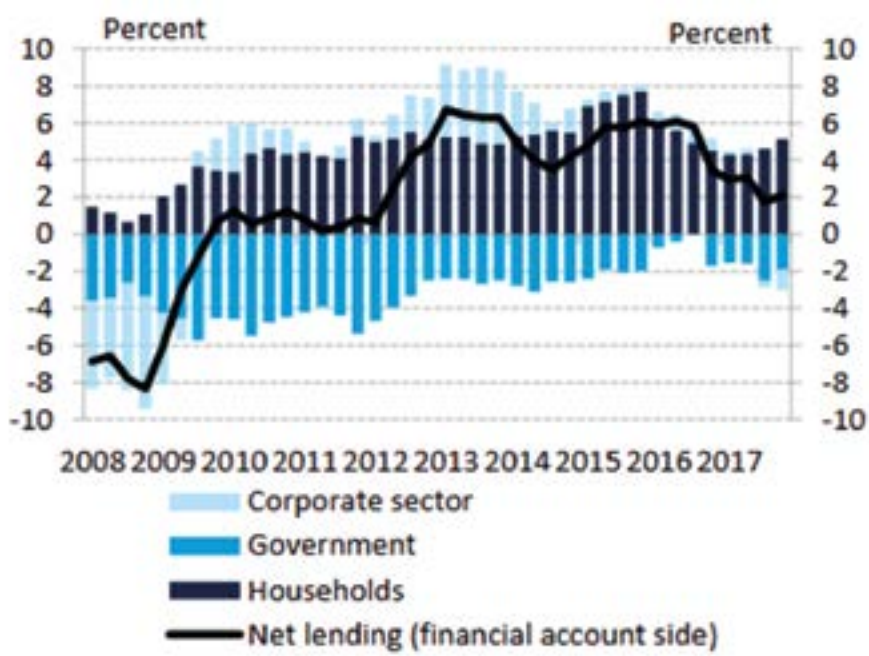

Figure 6

External financing capacity as a percentage of GDP, by sector

Source: MNB:, Inflation Report, June 2018

From the aspect of *economic processes* the same rapid improvement in the balance was driven primarily by the surplus of the foreign trade of goods and services. The total amount of Hungary's net exports had increased to 8% of GDP by 2015. The bulk of the exports ended up in EU member states.[21]

Another factor that has been profoundly affecting Hungary's financial position in turning positive is the category of on-balance sheet and off-balance sheet *international transfers*. In 2015 – when record amounts of EU support were drawn down – the surplus of EU capital transfers amounted to about 5% of GDP. In this way, although the dividend and interest income of foreign-owned businesses continue to appear in Hungary's international accounts as negative items – as in the case of all other countries in the Central-European region – the sum of the surplus of foreign trade (including agriculture, industry and services) and the income from international transfers now substantially outweighs the structural outflow of income stemming from net indebtedness.

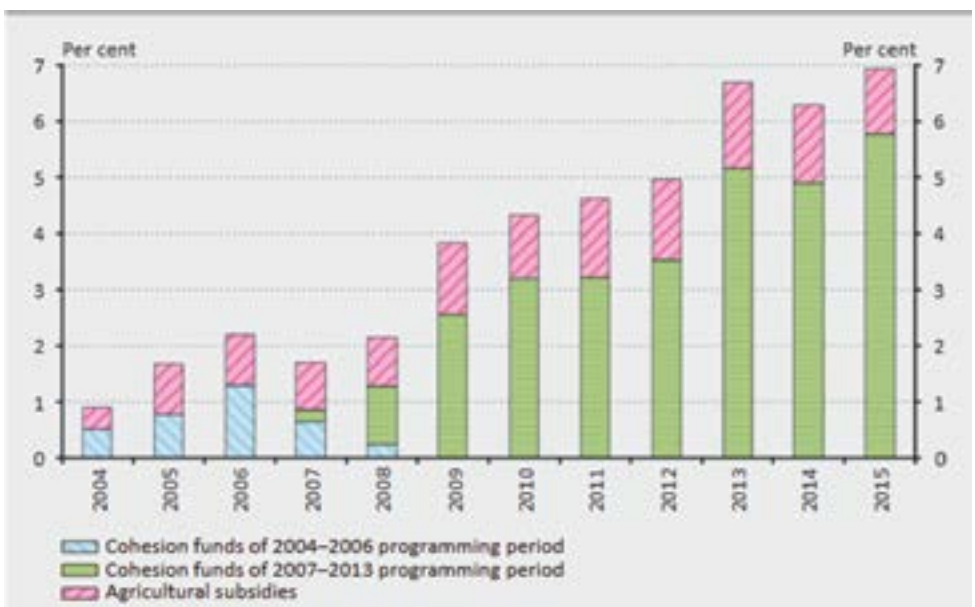

Figure 7

Gross inflows of EU transfers by programming periods, as per cent of GDP

Source: Boldizsár–Kékesi–Koroknai–Sisak 2016

[21] The deficit of foreign trade with the east – primarily: China – could not be reduced materially; indeed, the balance had grown a lot worse by 2015, and the projected slowdown of the growth of China's economy may continue to negatively impact Hungary's direct or intermediated exports.

Hungarian contributions must be subtracted from the gross amount of EU funds. Of course, owing to the relatively low level of development, Hungary massively benefits from the transfers, the net amount of which equal as much as 5–6% of GDP in certain years. While this is a widely known fact, it is less well known that after a while the state, rather than the private sector, became the main beneficiary of current and capital transfers, as is indicated by Figure 8.[22]

Figure 8

Net inflows of EU transfers by sector

Source: Boldizsár–Kékesi–Koroknai–Sisak 2016

[22] This is all the more noteworthy, because in Poland, for example, among other member states in the Central-European region, the state accounts for a significantly smaller share in the utilisation of the EU funds, as a result of which the population, the business sector and other non-governmental actors, are allocated proportionately more of those funds. Even so, Poland draws down a remarkably high proportion of the available EU funds (Boldizsár et al., 2016). It may be assumed that utilization is more reasonable and and purposeful in such a system than where the money is spent by state bureaucracy.

A variety of risk factors are to be dealt with in regard to EU funds. One is the question of what would be the result of the Central Eastern European region, including Hungary, receiving *significantly smaller transfers* after the closure in 2020 of the seven-year programme period. The aggregated demand – currently fuelled by EU funds that may be regarded as massive amounts even relative to macroeconomic proportions – would obviously decrease significantly in the next programme period. The altogether low *investment rate* would diminish and the economic actors (primarily agricultural businesses and land users) who have a substantial part of their revenues coming from EU transfers, would suffer a direct *loss of income*.

Hungary's growth rate, however, shows hardly any sign of the fact that additional funds, amounting annually to one to five percent of GDP, were used up in the economy year after year, in the period after 2008. This suggests that the economy has a better absorptive capability than its supply side adaptability: the ratio of non-productive spending must have been rather high, and substantial amounts may have "vanished" during the entire period concerned. Were it not the case, so much additional income, and, particularly, such massive investment transfers, should have perceptibly increased the GDP through enlarged stock of capital.[23]

It should also be noted that incoming transfers, whatever their structure and efficiency of their utilization, improve the external financial balance). Should the size of EU funds be reduced, such transfers will contribute less to the reduction of Hungary's foreign exchange exposure, but at the same time the macro financial effects of the repatriation of labour income will likely have grown even more significant by that time.

The external debt, the economic growth capability and other macroeconomic indicators make up only one group of components taken into account by external analysts when examining a country or a region. In addition to economic factors, organizations and institutions dealing with political risks also take account of the external exposure and the internal conditions by applying their own specific methodologies of for making projections. Hungary is ranked relatively favourably in such analyses (see, for example, the 2016 list of the Economist Intelligence Unit, in Figure 9).

[23] Another thing that follows from this is that EU transfers were to decrease significantly after 2020 (in reality, from 2022), it would also appear primarily in a decrease in macro demand and have a lesser negative impact on the amount of capital in the national economy as well as, as a consequence, on the macro supply at later stages.

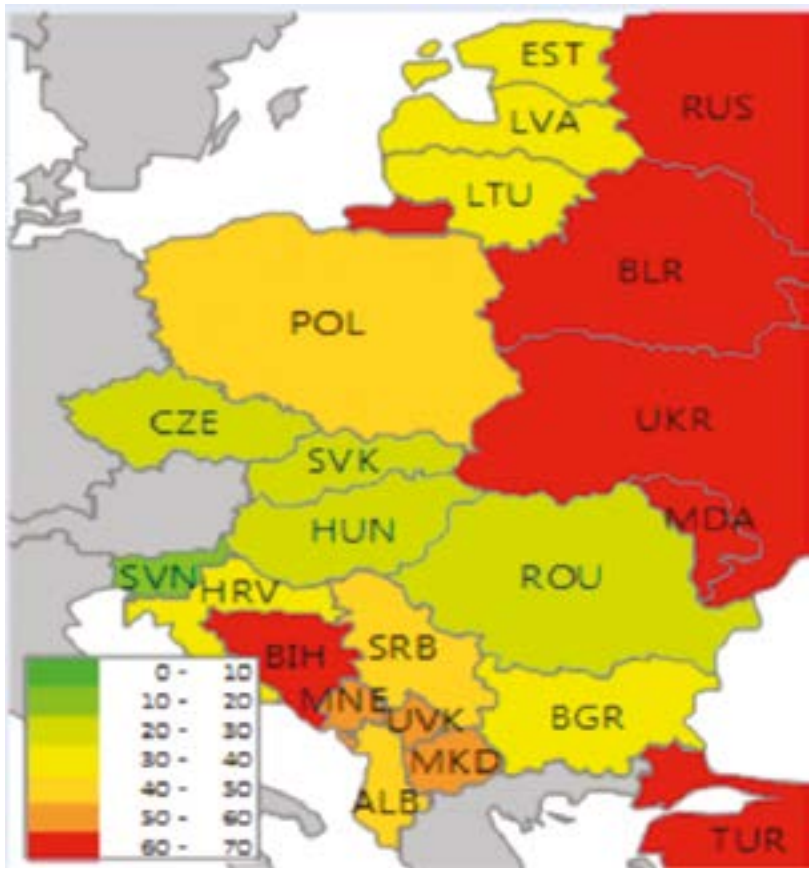

Figure 9

Political risk in the eastern segment of Europe

Source: IMF, 2016, www.imf.org/external/pubs/ft/reo/2016/eur/eng/pdf/rei0516.pdf

Slovenia with the lowest risks is followed by the category of Hungary, Romania, Czech Republic and Slovakia, while Bulgaria and Croatia are presented as countries with somewhat higher political risks. The *sovereign (country) risk rating* applied by the large credit rating institutes is methodologically more refined – though the ratings are always disputed. Hungary's rating by the three main institutions are similar (2018 data): Fitch: BBB minus; Moody's: Baa3; S&P: BBB minus. In each of the above cases the country risk rating falls in the so-called "investment grade category." In other words, financial products constituting the Hungarian state's promise to pay are no longer assigned to the "junk" category. This, however, is the least favourable rating among the V4 countries, equalling Romania's sovereign risk rating. Based on the clearly measurable national economic indicators (foreign exchange reserve, current and capital items, economic growth rate) the credibility of the Hungarian state could be rated one notch higher, but the *unpredictability* of the economic policy pursued by Hungary, as identified by economic policy analysts, is delaying the assignment of a higher rating. Frequent sudden changes in the applicable statutory regulations,

selective judgement by governments of external economic actors, and the excessively heavy dependence of economic growth on certain particular factors, such as the draw-down of EU funds or the economy's exposure to the automotive sector's cycles – these are the most frequently noted risk factors causing external analysts to take a prudent approach. At the same time, changes in international borrowing conditions and the premiums of insurance against the country's bankruptcy (CDS premiums) show that money market participants have more favourable perceptions of Hungary's capacity and willingness to pay. But of course terms and conditions of lending to the Hungarian state or businesses operating in Hungary would be even more favourable if Hungary's credit rating were investment grade. The international rating of Hungary's country risk is definitely worth thinking about – even despite the fact that the grading was improved several times between May and November 2016 – because the existing rating is the same as the rating that had been in place in the second half of the 1990s, when Hungary was not even a member of NATO or the OECD or the European integration, in short: Hungary at that time was not yet under external risk mitigating protection unlike now. Hungary's economic policy that is so difficult to understand and kept up with from the outside, a policy that is accompanied by multiple domestic and external conflicts and "engine rattle," entails some unintended effects that are causing obvious economic disadvantages.

Characteristics of the fragility of the Hungarian economy

The ratios discussed so far had to do with risks qualifying as rather prominent in view of the earlier path of the economy of Hungary. The fragility and disequilibria of member states may have consequences affecting the EU as a whole, therefore the financial crisis of 2008 and the subsequent debt crises in certain member states necessitated a joint *EU-level monitoring* of the relevant macroeconomic risk factors. In the context of such monitoring the relevant EU institutions are dealing with any possible internal imbalances of member states on the basis of a jointly applied methodology. It is worth taking a look into the analysis of the situation in Hungary (Table 4).

Table 4

Macroeconomic imbalance indicators

Description	Note	2007	2010	2012	2015	2017
Current account balance, percentage of GDP	3-year average	–7.0	–2.5	0.9	3.4	4.1
Net international investment position, percentage of GDP	annual	–88.1	–108.3	–94.4	–65.4	–54.8
Private sector debt – consolidated, percentage of GDP	annual	93.7	114.4	102.0	86.0	70.7
General government gross debt as a percentage of GDP	annual	65.0	80.2	78.3	75.3	73.6

Source: Eurostat, http://ec.europa.eu/eurostat/web/macroeconomic-imbalances-procedure/indicators

The steady improvement in the *current account balance* has already been noted here: it mitigates the external exposure of the economy even if the surplus is due to weak domestic demand. It is particularly the *lower rate of investment that should be justified by Hungary's level of development* that carries negative risks for years to come. Changes in the *net investment position* may also be interpreted in a similar way: the ratio of foreign debt to GDP has decreased substantially, indicating lower exposure, but what is behind this phenomenon is that the amount of foreign direct investment (FDI) is not expanding and it affects tie *growth potential* as well.

The rapid *decrease in the indebtedness of the private sector,* as presented in the table, is related to the fact that both households and businesses responded to economic developments and economic policy measures by increasing their savings and declining to borrow. Such a deleveraging after the financial crisis helps reduce the external exposure of Hungary, but restrained borrowing activity of private actors cast some shadow on future growth potential. The decline of the gross debts ratio of the public sector has been, modest relative to the private sector, and calls for further measures to reduce explicit public indebtedness (keeping in mind the large size of implicit debt of the Hungarian state, caused mostly by worsening demography).

New challenges facing Hungary's economy

The wide variety of data as well as business surveys and expert opinions reviewed here do not provide clear guidance concerning matters of economic security of Hungary. What helps in making sense of all these data is to consider experiences of other countries in similar situations, and to conduct a critical analysis of the earlier development path of the Hungarian economy, and to draw lessons from relevant academic literature. One may project future trends and the impacts of recent global processes only in a relatively wide range. The economy's risk bearing and shock resistance capacities are crucial, but in these respects one can make only cautious subjective estimates.

The following qualitative conclusions may be drawn, now in summary form, from the professional sources, data and expert opinions reviewed above.

- During the quarter of a century that has passed since 1990, which can rightly be considered a historic turning-point, Hungary has developed in to a *fully-fledged market economy* in terms of both its economic regime and structure. In historical terms, it has become a market economy *again,* as Hungary had been functioning before the decades of the centrally planned economy. Yet, the term of "returning to capitalism" (market economy) might be somewhat misleading as the world economy had, by the end of the 1980s, become different in some crucial aspects from the capitalism that the Hungarian economy was forced to disintegrate from after the Second World War, that is, from the image of market order that may have still have been lingering on in the memories of the older generations. Some of our existing economic security problems stem from the very fact that the Hungarian society and economy (along with a number of other nations sharing the same fate) found themselves in 1990 in circumstances for which they *had not been prepared,* and its *adaptability* proved to

be insufficient for making the transition (return) tolerable in terms of difficulties and speed, for the majority of the society.

- The consequences of the lack of preparedness and the insufficient adaptability of the society include a *dramatic decrease in labour market activity* during the first years of the regime change and slower than potentially possible re-activation through the subsequent years of economic growth. Labour market activity rates have been improving as a result of the efforts made by government after 2010, but actual reintegration into value-generating division of labour is seriously impeded by the frequent lack of employability among the unemployed, public workers and the temporarily inactive due to lack of qualifications, bad health status, inadequate motivation even during periods of economic growth when tens of thousands of vacant jobs are being advertised.
- Manifestations of social inertia include, *inter alia,* the long fixation of *inflationary expectations*. The end of rising prices was brought about by decreasing international energy and raw material prices and years of stagnation of domestic demand in 2014–2015; the trend of disinflation was even reinforced by the state's growing price regulating activity ("the fight against utility bills"). Trends of inflation have been quite hectic for a long time now, dominated largely by external factors and turns in the state's economic policy. The 3% annual inflation target under the inflation targeting system – formally announced in 2001 – was often exceeded by the actual price index many times over (with 7–8% consumer price increases), however at other times it was way below (with 0% or even negative price indices in 2014–2015). One cannot declare in full confidence that price stability – a norm and value – has been organically integrated in the Hungarian society.
- Demand for being bailed and being subsidized by the state has been strong, with the political elite ready to satisfy this demand. *Expenditures for economic purposes* (price subsidies, interest subsidies) make up a remarkably large proportion of Hungary's budget. The *quasi fiscal* type of credit stimulating programmes launched recently by the central bank (MNB) ("funding for growth programme" 1 and 2), and economic activities through its foundations (real estate development, education development, business development promotion) may also be regarded as belonging to this category. Two main risks stem from fiscal and quasi fiscal activities on a scale more extensive than those in the peer countries: (1) a massive potential expenditure side pressure on the general government budget; (2) a substantial proportion of economic actors gets accustomed to and become dependent on state assistance, and when it is terminated, they may suffer adaptation losses.
- State activity, due to its sheer size, leads to high taxation which is rather *excessive* in comparison to those observed in other countries in similar situations. High nominal tax rates and, particularly, the large number of tax types lead to increasing threat of tax evasion and fraud, and makes tax collection more expensive (in the World Bank's *"doing business"* lists and in international competitiveness ranking lists Hungary is placed in extremely unfavourable positions in regard to the evaluation of the taxation system as a business/competitiveness factor).
- The prevalence of sectoral taxes and taxes levied to small groups of taxpayers (as well as possible exemptions from such taxes) will lead to a significant increase in

the *possibility of corruption and unlawful discrimination.* A legitimate governmental endeavour that can be accomplished by selective taxation (e.g. stimulating small businesses) may easily find itself in conflict with accepted international tax harmonisation obligations (WTO, OECD, EU). Foreign-owned large enterprises on which special taxes have been levied turn to their respective governments for help, raising the issue to the level of international diplomacy.

- The application of selective instruments of the state the government's direct intervention in economic competition offer short term solutions for dealing with sudden crises involving specific companies or sectors. The state's regulatory and microeconomic activities and its operations as owner, however, lead to increased *uncertainty* perceived by economic agents, which, in turn, may reduce their investment activities. Any deterioration in the business climate immediately weakens the country's capability to attract capital and it erodes the propensity of new businesses to settle down in Hungary, while those already present may respond by repatriating their profits. New investors expect increased allowances and stronger incentives than those offered elsewhere. The number of investors coming from regions where business culture is less transparent may also increase, with all of its subsequent risks.
- Conditions in Hungary have not been approximating the norms of economically successful and competitive European core regions in terms of social attitudes, legal compliance or entrepreneurial and innovative skills; instead, they have been growing increasingly similar to those of the group of Serbia, Bosnia and Bulgaria.
- As reflected by the results of the Pisa tests, young people's achievements in terms of knowledge and skills are more like mediocre, without any sign of real improvement. This may be a critical aspect if demand for labour in sectors requiring medium qualifications and semi-skilled labour, that is, activities which can be relatively easily carried out by robots and algorithms, declines radically in Europe, due to the unfolding of what is referred to as the 4th industrial revolution. It is already apparent that industrial and service jobs that used to be regarded as sources of secure employment are starting to become unnecessary in some economies as a consequence of the development of artificial intelligence, digitising, and the virtualization of a variety of formal jobs.
- Aggregated demand was boosted by EU funds after 2008, during a period when Hungary's economy was characterized by weak domestic demand. The use of such funds is not without risk factors. Funds were spent during the preceding government term on grandiose infrastructure projects (such as the No. 4 metro line in Budapest) where external – civil – control is not possible as a result of the very scales of the projects; the risk of corruption is increased by the fact that only one or just a handful of potential contractors can undertake such projects. It was after 2010 that a policy was adopted with the aim of drawing down and spending in Hungary as much of the accessible funds as possible ("no EU fund should remain unspent"). This principle may seem rational but in fact is relegates aspects of efficiency and legality of spending of funds into secondary importance, and increases moral hazard.
- While from an economic aspect the process of the regime change was essentially completed and closed in a period of two decades, *economic performance* failed to reach a level that would have been required for enabling the whole or even just the

bulk of society to enjoy the benefits expected of a market economy. In other words, Hungary did not become a developed country in a quarter of a century – not even in the sense in which the Czech Republic or Slovenia is categorized as such, according to the majority of rating indicators or classification systems.

- Relative lagging behind other Visegrad nations first failed to draw the attention of the public or the political elite, and so it did not mobilize them, since the conventional frame of reference was made up of highly developed western market economies anyway. The process of *real convergence* with those countries *has been very slow and got stuck from time to time,* like between 2005 and 2012. Initially this only takes the form of dissatisfaction with the existing social and economic order, disappointment with expectations relating to the regime change, but when the labour markets of West European countries were opened up, Hungary also joined the group of countries in the Central Eastern European region from economically motivated migration started in earnest. By the turn of 2015 and 2016, some 3% of Hungary's labour force had left the country. This ratio is lower than in the case of Romania, Bulgaria, the Baltic states, and Poland, but the rate has been accelerating.
- Thus it is the decline in the growth rate rather than a sectoral, financial or even general economic crisis that constitute veritable macroeconomic risk (or social risk motivated by economic reasons) lies in a decrease. At the same time, the main national economic risk factors that had caused major problems earlier on (such as uncontrolled increase in the government debt, unemployment, inflation, the freezing of the credit institution system, the impossibility of financing the social security system) have only apparently vanished or been degraded to secondary importance. Some of them – such as the inflationary expectations or the excessive central budget deficit – appear to be decreasing, after the first two decades of transition. Still, too may live from the general government system – and this poses a structural pressure towards keeping state revenues at a high level. The state itself is all too ready to resort to means of intervention – this then prolongs its high demand for public revenue, necessitating high rates of taxes and income centralization. The fact that Hungary's general government budget is considerably more extensive than those of its competitors in the CEE region leads to loss of competitiveness.
- The very existence of an extensive state leads to high exposure to corruption. According to the corruption perceptions index established by a survey conducted by Transparency International, Hungary was in the 57th position among the countries concerned, indicating a deterioration in comparison to its position established in earlier years in 2016, and 66th in a year after. In terms of the risks of corruption Hungary is way behind Estonia, Poland and the Czech. Apart from Greece and Italy, as well as Bulgaria where corruption is at its worst, the situation was better in all EU member states than in Hungary.
- The failure to catch up with the developed world in medium income countries (including Hungary) causes *disappointment* among large groups of society. International experience shows that under such circumstances in democracies the social elite may suddenly lose influence, or unpredictable movements, incapable of governing the country may seize power, while in centralized and autocratic regimes upheavals may be caused by insurrections against the state power among those whose upward

mobility got stuck. In the Hungarian circumstances the real threat comes primarily in the form of *the emigration of masses of young people and those with higher than average qualifications,* and the *increase of the proportion of dependants (elderly people, working age inactive people)* and it may have serious consequences even in the short run in regard to the sustainability of the social security system, to regional issues and political activity.

- It is becoming obvious in view of the new tendencies in technological development, specifically the day-to-day consequences of the so-called fourth industrial revolution, that the *dependent market economy model* that came into being at the time of the regime change – *cheap highly trained labour combined with western capital, technology and institutional order – has depleted its development potential* in the more developed countries of Central and Eastern Europe, including Hungary, during the past two decades. *The confusing* impacts of the 2008 international financial crisis make it difficult to identify and solve the particular tasks faced by the CEE region. The European consequences of the international crisis do not facilitate the process of finding adequate forms for getting integrated in the new global economic conditions. It is clear, however, that the existing human capital, qualifications, attitudes and the given level of social confidence are not sufficient for keeping abreast of competing regions of the globe. No future lies in the growth model based on simple wage level advantage, and its continuation can easily lead to increasing social tensions.

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László Szarka

Question marks related to energy security and environmental safety

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Abstract

Global energy perspectives and the relationship between energy and environment are summarized from the viewpoint of earth- and environmental science. Instead of the terms "renewable" and "non-renewable", it would be more precise to use the terms "stock-kind energy" and "flow-kind energy". Among the environmental impacts of energy production and consumption, a list of various multidimensional and very specific (among other non-linear and retarded) environmental impacts of (1) the production of primary energies, (2) their transformation to secondary- and (3) tertiary energies, and finally (4) the environmental impacts of the end-use of energy (i.e. the consumption) is given. The intensity of human activity is characterized by a primary energy use of 18 terawatts. By using this huge power, human beings do the following activities: transformation of continent surfaces, pollution of waters, soil and air, influencing the climate, depletion of natural resources (both raw minerals and energy sources), increasing the number of nature-humanity interactions called "natural catastrophes", the global trade (leading to species invasion, biodiversity and ecosystem collapse). The way of life of the Homo sapiens leads to physical and mental degradation, but humans still seem to need even more and more products and services. Knowing all these multidimensional consequences, to concentrate exclusively on CO_2 emission is equivalent to hiding – either in a naïve or deceptive way – the causal relationships. Both of the two main issues (satisfaction of energy demand and its environmental impacts) are found to be alarming. A global consuming society is surely not sustainable. We should prepare ourselves to situations and processes, which are very different from those of the recent past. Hungary's natural resources have become important, but the long-term energy security depends on the availability of a larger amount of local energy sources.

Keywords: limits to growth, Future Earth, sustainability, fossil energy, stock (exhaustible) energy, flow (renewable) energy

Introduction

Energy, fresh water, soil (food), raw material, and appropriate natural environment: these are essential but also limited preconditions for the human society. If these are missing, social tensions will develop. In this study book, the definition of safety and security is "a notion related to the threat of existence of groups of the state, the society, and/or the citizens (related to the possible occurrence of a situation sharply or drastically differing from the normal lifestyle)" (Tálas, 2016). The definition of energy security according to the International Energy Agency: "the uninterrupted availability of energy sources at an affordable price" (IEA, 2017). This also shows that studies about energy security (in fact about the future availability of energies, and the connection of energy and the environment) mainly apply an economic, financial, and political approach. Considering the fact that (1) the non-renewable (stock-kind) energies are connected to geological formations that are generated through specific geological processes, (2) the so-called renewable (flow-kind) energies are also parts of the natural system, and (3) the presentations of the environmental impacts of energy are usually connected to some interest; therefore this study expressly aims at taking an earth- and environmental scientific approach to the issues of energy- and environmental security. The conclusions reflect the author's personal opinion.

Energetic experts have always shared the opinion and usually think (see e.g. Vajda, 2014) that humanity will find the solutions to meet energy needs – as always did in the past. The green approach has changed a lot in the past decades, and today's situation is rather contradictory. Some issues of environment pollution, and even the disruptions occurring in the natural cycles, have been attracting the attention since the sixties (Carson, 1962; Ehrilch, 1968; Jócsik, 1971). But at the Stockholm World Environment Congress in 1972, they came to the conclusion: "only the potential of well-developed industries and agricultures are able to produce the sums and assets necessary for the prevention of further environmental pollution and for the restoration of the disrupted biological balance" (Kocsis, 1976). At the same place, the countries of the so-called third world declared that they would have liked to have big industries and also big environmental problems. Then, in the 1980's, several companies recognized that financial performance could be improved through focusing on environmental aspects (Zilahy, 2017). The concept of ecological footprint gained ground in the nineties. Even though today we already consume 1.4 times the Earth's capacity, the aspects of greenhouse effect have been prioritized. Namely, the emission reduction commitments – due to the mutual cooperation of the states and the companies – have become a means of further economic growth and environment transformation (Kondor–Kovács, 2017). The turning point might have been when Al Gore, former US Vice President, having extensive interests in the green economy, was awarded the Nobel Peace Prize in 2007. Today's so-called green paradigm focuses on reducing CO_2-emissions (and thus retaining global warming under the 2 °C level). Thus, the so-called green idea in fact has become one of the means and ways of further economic growth.

So far as earth- and environmental science is concerned, it is obvious that ultimately we get all of our resources from nature. Therefore, we must examine the balance of humans and the environment, including the possibility of a green economy. Quoting Gyulai (2010): "the most magnificent mission today's science can have is to research whether 6–10 billion people may live on the Earth – what is more: with the tigers also surviving…". Al Gore:

According to the ethic message of his book *An inconvenient truth* (which was cut out from the Hungarian version): "Now it is up to us to use our democracy and our God-given ability to reason with one another about our future and make moral choices to change the policies and behaviors that would, if continued, leave a degraded, diminished, and hostile planet for our children and grandchildren – and for humankind" (Gore, 2006; Szarka, 2007). In accordance with Crutzen (2002), due to the ever growing and unstoppable intervention into nature, we talk about a new age, called the Anthropocene age. In my opinion, today the question is not whether we have entered the Anthropocene, but how long the Anthropocene age will last with the accelerating economic growth.

In the section overviewing energy sources, you will see that quite many facts and concepts needed for judging energy security is not so clear – even though energy is an exact physical concept. The issue of the security of energy supply (in natural resources aspects, but also touching the technical side), the controversial relationship of energy- and environmental security, and the hypotheses related to the two major potential dangers (possible energy shortages and the destruction of nature) will also be discussed. For a relative good energy security of Hungary in the future, I think focus should be put on achieving a greater share of local energy sources.

Energy sources

Energy is one of the most general properties of the material. In the common formulation, energy is the work potential of the system while it is transforming from one state to another – in accordance with the thermodynamic principles. To understand this in practice, you need to know some classic energetics textbooks and monographs (e.g. Vajda, 2001; 2004; 2006; 2009; 2014; Büki, 1997). For example, the work of Hulscher (1991) provides an excellent overview, available on the Internet. In order to have a concept about the theoretical possibilities of the various types of energy, Table 1 shows the energy content of several materials weighing 1 kilogram, being surprisingly diverse.

Table 1

The energy content of various energy sources

Energy source (1 kg)	Specific energy content (MJ/kg)
mass-energy equivalence	89 876 000 000
hydrogen-helium fusion	645 000 000
uranium (235)	80 250 000
liquid hydrogen	130
natural gas	50
crude petroleum	40
coal	30
methanol	20
dried wood	20

lignite	15
dried plants	15
straw	13
raw firewood	8
domestic waste	8
water, condensation heat	2.257
water (between 100−0 °C)	0.418
water, freezing heat	0.334
batteries (from lead to lithium)	0.1–2.5
mass, falling from 100 m	0.001
mass with a speed of 10 m/s	0.0005

Source: Wikipedia; SZARKA (2010)

Energy types from natural resources are called primary energy. These are transformed − through producer transformation − into secondary and then tertiary ("ready for consumption") energy, of which the consumer disposes. Unfortunately we cannot avoid the usage of the word "energy consumption" which is incorrect in the physical sense.

Stock-kind and flow-kind energy types

Energy types are commonly classified as not renewable and renewable. In my opinion, the usage of the term *renewable energy* (the origin of which can be traced back only to the 1970s – even though almost exclusively only these kinds of energy: firewood, windmills and watermills were used until the industrial revolution) is not appropriate, as it may give an improper impression (challenging the law of the conservation of the energy). That is why I recommend that primary energy sources should be grouped into *stock-kind* and *flow-kind* groups. So, the stock-kind energy has been generated by accumulating through a terrestrial process (*terrestrial stock*), while the flow-kind means the energy that we get through tapping the current natural processes. Coal, hydrocarbons, and nuclear fissile materials are stock-kind; and the geothermal energy is basically also stock-kind. The solar-, hydro-, wind-, biomass-, and even the wave energy is flow-kind: they all are taken from tapping the natural processes controlled by the Sun. Tidal energy (as a renewable energy) comes from the interaction of the Moon and the Earth. The Earth's rotational (kinetic) energy is stock-kind, as if it was utilized, then the rotation would slow and stop after some time, having consequences. An "inexhaustible" energy may self-evidently come only from an extraterrestrial source.

The boundaries between stock and flow, i.e. non-renewable and renewable energies are not necessarily definitive. (There is a significant overlap in case of biomass.) To judge whether an energy is exhaustible you must consider the scale of time and space. For example, the huge geothermic energy stocks (as a terrestrial kind of energy) can only be reached locally and very slowly – through water heat mining, which may seem to be flow-kind. However, the energy captured through near-surface heat pumps, commonly classified as

geothermic, utilizes the heat of sunshine stored in the ground, so that is clearly renewable. Whether or not a source of energy is exhaustible is shown also in the classification of renewable energies (Table 2): Goldemberg–Coelho (2004) has classified biomass – considering possible overuse – within the non-renewable group.

Table 2

Classification of so-called renewable energy sources

<table>
<tr><td>“New” renewable energies sun (heat and electric), wind, tidal, geothermic (heat and electric)</td><td>“Modern” biomass (heat, electric, ethanol)</td><td rowspan="2">Hydropower</td><td rowspan="2">Conventional biomass (renewable)</td><td rowspan="2">Conventional biomass (non-renewable)</td></tr>
<tr><td colspan="2">“New renewable energy sources”</td></tr>
<tr><td colspan="4">Renewable energy sources</td><td>Non-renewable biomass</td></tr>
</table>

Source: Goldemberg–Coelho, 2004

The origin of coal, hydrocarbons, nuclear energy, and earth heat

Coal is plant material which has been buried at rich-coastal and land swamps with rich vegetation, and transformed due to the temperature- and pressure rise; the name of its lignite variant refers to firewood (lignum = tree, wood). Petroleum and natural gas are generated through the transformation of plankton and algae in ocean sediments, at temperatures of 80–200 °C. Petroleum and natural gas – moving away from the place of creation – accumulates in “stratigraphic” or “structural” traps. The common characteristic of so-called non-conventional hydrocarbons is that they are less mobile. Oil sand, heavy oil, and oil shale are such kinds of petroleum. Basin-centered gas accumulation *(BCGA*), the so-called methane hydrates, and the methane (as a coal seam gas) are classified as non-conventional natural gases. All coals and hydrocarbons are so-called fossil energy sources (containing living organism residues). These mineral fuels, having organic material origin, are the solar energy conservations of earth ages. They are being generated today as well; but not as fast as we are consuming them. With regard to the pace of extraction, we are right calling this energy source exhaustible. Another stock-kind energy is the fission-based (or *fissile*) nuclear energy, the geological deposit sites of which are the enrichments of uranium, which is present in the Earth crust at an average of several ppm (uranium ^{235}U isotope, and thorium which is similar to uranium). Some (great?) part of the internal heat of the Earth is in fact the consequence of the natural radioactive decay. The other part of the internal heat of the Earth derives from phase transformation processes (the continuous solidification of the inner rim of the liquid outer core, i.e. the slow growing of the internal core).

Energy generation, transformation, utilization

The utilization of natural forces is a multi-step process – as shown in Table 3 – with overall fairly low (less than 15–25%) efficiency (as regards the "effective" results).

Table 3

Primary, secondary, tertiary, and effective energies, and their generation, with examples

Energy	Technology	Examples
natural properties		places where terrestrial energy may have accumulated; sunny or windy places, rivers, forests
	generation: extraction, collection, capturing, by various means	*mining (coal, hydrocarbon, uranium ore mining), logging, production of energy capturing equipment: windmill (wind turbines), solar panels, photovoltaic transformers, dam construction*
primary energy		coal, petroleum, natural gas, uranium ore, biomass, hydro-, geothermic-, solar-, and wind energy
	transformation	*power plant, burning furnace, finery*
secondary energy		refined petroleum, electric energy, heat, biogas
	transportation/ transfer	*freight transport, pipeline, power line*
tertiary energy		coal, diesel oil, gasoline, charcoal, electric energy, heat, biogas
	transformation	*engines, heaters, stoves*
effective energy		end use *(shaft power),* heat, light

Source: using: Hulscher (1991)

Primary and secondary energies belong to the production sector. The consumer gets the so-called tertiary energy. This is utilized in the form of mechanic work, transport, heating and cooling, lighting, IT, communication, etc.

The history of energy

In the beginning, the energy source at man's disposal was human force. Various other energy sources (animal power, biomass for fire, and then hydro- and wind energy) were involved with a slowly increasing intensity. With the industrial revolution, energy usage grew steeply (through the use of coal as energy source). For further growth, man found energy source in another solar energy conservation of the earth history: the hydrocarbons (first petroleum, later natural gas); and then later, the second half of the 20th century saw the arrival of the nuclear age, but its growing faltered in 1986 (and also in 2011). Hydrocarbons have become the ideal fuel of transportation in the 20th century, and also played an important role in heating and – in the 1970's – in the production of electricity. Electricity production was

launched in the second half of the 19th century: from coal and hydropower, roughly at the same time. Nuclear energy has played a role in electricity production since the middle of the 20th century. Today, the world's nine largest power plants are hydropower plants (the largest, in China "Three Gorges Power Plant", with an output of 22.5 GW).

Emission

As the so-called energy- and climate politic aspects have come to the fore, energies have been recently and mainly classified on the basis of emissions narrowed down to the so-called greenhouse gas emissions. The first step of turning fossil energy types (mineral fuels) into electric energy is a chemical reaction (burning), which generates heat and CO_2 – and, in case of hydrocarbons, also water. As a result of the primary energy distribution under Table 4a. and 4b. (coal: 26–30%, hydrocarbon: 52–56%) and the reaction equations below:

$$C + O_2 \rightarrow 394 \text{ kJ/mol} + CO_2,$$

and

$$CH_4 + 2\ O_2 \rightarrow 802 \text{ kJ/mol} + CO_2 + 2\ H_2O,$$

roughly the same molecular number of CO_2 and water is released. Current CO_2 emissions from the burning of mineral fuels and biomass are about 40 gigatons/year, and water release is also significant. When biomass is generated, the same amount of water and CO_2 is bound as is released when biomass is burnt. The equation of photosynthesis:

$6\ CO_2 + 6\ H_2O$ + energy (sunshine, min. 540 kJ/mol) + chlorophyll $\rightarrow C_6H_{12}O_6 + 6\ O_2$

Thus, the three basic methods of anthropogenic decrease of the atmospheric CO_2 level are represented by the processes described by the above equations. (Besides biomass and organic sediments, the generation and weathering of carbonate rocks play also an important role in carbon circulation.) The CO_2-emission of natural processes is much greater and more diversified than the anthropogenic one.

In addition to greenhouse gas emission, the emissions may have a number of other chemical (e.g. aerosols, soot among others) and physical (e.g. heat, electromagnetic, acoustic) forms. Most of the energy used by mankind is released into the environment as heat – due to the bad efficiency of the production, transformation, and utilization of energy sources. Further examples: geothermic water heat mining may cause the emission of the most various chemicals; while in case of nuclear energy, precautions must be taken in order to prevent radioactive emissions. (Nuclear energy is "emission-free" in the greenhouse gas sense.)

Energy situation

The distribution of the world's primary energy production by energy types in 2014 is shown in Tables 4a. and 4b. – according to two different sources. Table 4a. also includes the estimated value of the non-commercial conventional biomass energy; while Table 4b. only includes various commercial energies; but even apart from this there is some difference between these two. The total amount of the generated and used primary energy increases every year also today.

Table 4a

The distribution of the world's primary energy production by energy types in 2014

Coal: 26.1%	CO_2-emitting fossil energy	Fossil and fissile energy
Hydrocarbons (petroleum and natural gas): 52.2%		
Nuclear energy: 2.6%	CO_2-free fissile energy	
Conventional biomass: 9%	Conventional renewable energy	Renewable energy
Water (electric): 3.9%	Modern renewable energy	
Electric (wind, solar, geothermic): 1.3%		
Heat (modern biomass, geothermic, solar): 4.1%		
Fuel-biomass: 0.8%		
Primary energy total: 100%		

Source: Wikipedia

Table 4b

The distribution of the world's primary energy production by energy types in 2014

Coal: 30%
Petroleum: 32.6%
Natural gas: 23.7%
Nuclear energy: 4.4%
Water: 6.8%
Renewable (without water): 2.5%
Primary energy total: 100%

Source: British Petroleum, 2015

The ratio of the different energy types have hardly changed at all in the past decades: the ratio of fossil energy has been slowly decreasing (by less than 1% per year). The world's energy production was about 18 TW power in 2014 (that is 18 terajoule = 18×10^{12} J per second); while in 2008, it amounted only to 15 terawatts. Depending on whether conventional (non-commercial) biomass is taken into account, coal and hydrocarbons amount to 78–86%, nuclear energy to 3–4%. Hydropower and other modern renewable energies (wind-, solar-, geothermic energy, biomass, biogas, etc.) together represent less than 10%, and the greatest of them is the hydropower.

The geological reserves embodied in the energy sources may change (grow) as a result of the continuous geological-geophysical exploration; however, the exploitable reserves depend on the current economic and rationality conditions. (For example, on whether more energy must be invested than can be extracted.) Reserves estimations are based on very heterogeneous "guesses". We do not have reliable information even about the amount of con-

ventional biomass; and, regarding fossil energy sources (especially hydrocarbon reserves), we are likely to experience conscious disinformation. The data of British Petroleum are most commonly used (British Petroleum, 2015). For this reason, the opinion of some Hungarian experts should also be taken into account (e.g. Bárdossy et al., 2008; Kovács, 2012; Pápay, 2015). During the international year of the planet Earth (2007–2009), the global petroleum reserves were estimated to last forty years; natural gas – seventy years, coal – two-hundred years, and nuclear energy – several hundred years (with the production levels of that time).

Table 5. illustrates the increase of energy use in a fifty years scale. The most amazing information of the table may be the fact that in the 15 years between 2000–2015, we consumed almost as much energy (two-third) as in the half century from 1950 to 2000. The world's energy use has also been continuously increasing since, and this increase seems to be unstoppable. The energy used from 1800 to 2015 amounts to more than 30 ZJ (1 zettajoule = 10^{21} joule). For comparison: the total fossil energy reserves of the Earth are estimated about 39 ZJ. These data (if they are true) warn that we have used up about a half of the fossil energy stocks.

Table 5

Humans' energy production (usage) since 1800 and projected until 2050, in zettajoules (ZJ), in fiftyyears intervals, calculated for the time beginning from the industrial revolution

Time period	Energy of the period	Time period	Sum of energy
1800-1850	1 ZJ	1800-1850	1 ZJ
1850-1900	1.5 ZJ	1800-1900	2.5 ZJ
1900-1950	7.5 ZJ	1800-1950	10 ZJ
1950-2000	13.75 ZJ	1800-2000	23.75 ZJ
2000-2015	9 ZJ	1800-2015	32.75 ZJ
2015–2050 without further growth	**23 ZJ**	**1800–2050 without further growth**	**55.75 ZJ**

Source: Szarka, 2017

The future of energy provision

According to most energy experts, we do not have to be afraid of the depletion mineral fuels (there are enough prospective reserves: Glover–Economides, 2010). There is a lot of non-conventional deposits, the arctic areas are also accessible, and they also list many possibilities of alternative substitutions. According to these views, the use of coal, petroleum, and natural gas will be decreased due to "environmental protection causes", and their place will be taken over by nuclear energy and renewable energy types (Tucker, 2008). The past years have seen a number of energetic novelties (the peddle-bed "city supplier" module reactor, new developments regarding fuel cells and batteries, the methane hydrates, nuclear fusion) (Letcher, 2008). The second 2013 edition of Letcher's book (Letcher, 2013) includes further 11 chapters (solar thermal power plant, developing countries, energy sources

of oil- and gas producers, arctic drillings, non-conventional petroleum and gas, thorium in the field of fission, ethanol- and other transportation fuels, stratum fracturing, intelligent networks, new battery types, environmental respects, and the energy future of China). Regarding exhaustible energies – if the utilization of ^{238}U and the more frequent thorium is successful – the possibilities of nuclear energy usage may be significantly extended. Among the renewable energies (see Rybach, 2010; 2014) the geothermic HDR *(Hot Dry Rock),* EGS *(Enhanced Geothermal System),* and HWR *(Hot Wet Rock)* are noteworthy but fairly limited. Their common precondition is to have hot (about 200 °C) magmatic or metamorphic rock masses, reaching deep in the ground. Such may occur everywhere, regardless of the local geothermic conditions.

There are more and more prognoses impairing the concept about the richness of energy sources. For example, it seems that the rate of hydrocarbon production cannot be increased any more. The energy demand growing in the future as well will probably lead to a quasi-total depletion (all stock-kind energies, i.e. Earth energy reserves will run out sooner or later). We do not expect the implementation of nuclear fusion (hydrogen-helium fusion going on inside the Sun) on Earth, nor any other yet unknown solutions in the coming decades.

If the so-called renewable energies are unable to meet today's – rather intense – demand, energy poverty may occur. According to the EU document draft issued in the middle of May 2016 (not public at that time) (Szegedi, 2016a), the European Committee would still encourage members to use nuclear energy. Among others, the Committee promotes the construction of so-called mini nuclear plants. According to an interviewed expert, nuclear plants are needed until "energy storages is achieved" (Szegedi, 2016b). However, the chance of storing that amount of energy is quite low...

Besides pumped water reservoirs, there is no substantive progress in the issue of energy storage, there are only several ideas, such as compressed air preparation or hydrogen production. Batteries need a lot of materials; while the hydrogen produced from water through electrolysis is difficult to store and dangerous to handle. Every high-power energy storage is in fact like a highly explosive material (Gyulai, 2010). As regards hydropower (the energy of rivers), we find that a power plant has been built at most of the places having good features. The use of flow-kind energies broadens very slowly (its increase rate seems to be high only in comparison to itself; and it is hopelessly far from being comparable with coal or hydrocarbons). The so-called Energy Return on Energy Invested *(EROEI) indicator becomes ever lower.* Regarding EROEI, there are doubts about many renewable energy kinds and non-conventional hydrocarbons. For example, we may query about the so-called "Bio-Energy with Carbon Capture and Storage" *(BECCS)* process, where the basic idea is that the CO_2 generated during the burning of biomass for electric energy shall be stored under the ground. Even the simple Carbon Capture and Storage *(CCS)* may significantly lower EROEI (in any case, it makes the utilization of coal quite expensive).

Al Gore and Vaclav Klaus have contrary opinions regarding the possibilities of renewables. The former American Vice President is unlimitedly optimistic, while the former Czech President thinks "the aim behind the scare stories about the greenhouse effect and global warming, and the violent propagation of so-called renewable energy kinds is the interested (research, enterprise) lobbies' aspiration for tapping the central (state) budget" (Szarka, 2009). The doubtful situation of renewables is expressively illustrated by the Italian electric energy import, coming from the Swiss water reservoirs, which are in turn not filled

by mountain creeks in Switzerland, but by the electric energy generated in nuclear plants in France. Italy buys that "laundered" (Courtillot, 2015 – oral communication). Several theoretical and practical discussions[1] show that the possibilities of renewable energies do not reach the level of the current energy demand.

In summary, we can conclude that significant research & development works are being carried out for the energy supply of the future, with uncertain results. In the following parts, the role and possibilities of energy will be reviewed from the point of view of the nature.

Energy and nature

Nature is a more general expression, and environment is more anthropocentric (meaning the natural elements held important by humans). The direct living space of humans is in fact the biosphere (a part of lithosphere, hydrosphere, and atmosphere where there is life and biologic processes take place). Considering the 20 km thick spherical shell from the seabed to the stratosphere as the biosphere, then its volume is less than a seven-millionth of the volume of the solid Earth. (If the Earth is considered to extend to the magnetopause, being ten times of the Earth radius far, then the biosphere would be nano range in comparison.)

Mankind has used up about 30–40 ZJ primary energy since the industrial revolution. As a comparison, let's have a look at several natural energies.

1. During an earthquake, as much energy may be released as we have utilized since the industrial revolution in total. (The energy of the earthquake at the Indian Ocean on 26 December 2004 amounted to 40 ZJ.)
2. The heat released during basaltic volcanism is probably very large, too; e.g. about 10 thousand ZJ in case of the 2.5 million cubic kilometer basalt generated through the basaltic volcanism in the Central Atlantic.
3. The amount of solar energy coming to the Earth is about 40 ZJ in less than three days (15 ZJ/day, meaning 17 thousand TW power).
4. The heat content of the upper 1 km crust of the Earth is 40 thousand ZJ (the Earth heat released to the atmosphere amounts to 40 terawatt, more than twice as much as the energy usage).
5. The kinetic (rotational) energy of the Earth is 200 million ZJ.

The amount of energy used by mankind is surprisingly small compared to these. That is why many people think that stock-kind energy sources are 100% replaceable by the flow-kind energies derived from the Sun and the inside of the Earth. (We do not know – today – about any utilization ideas regarding earthquakes and vulcano eruptions which have unpredictable place and time, or about the artificial slowing of Earth rotation…)

[1] For example, look at McKay's (2006) calculation regarding the case of Great Britain possessing huge marine *(offshore)* areas.

Tapping possibilities of natural energies

The energy of the Sun – which is the source of all renewable energies except the geothermic – really seems to be *abundant*. In each second, the amount of fossil energy used by humans today is more than 1/10,000 (1/7000) of the energy of the sunshine reaching the Earth; and the amount of renewable energies used is about one millionth of the energy of sunshine. We would raise the question whether we can produce energy of 1/10,000 of the Sun's energy or even more, by tapping the currently available energy of the Sun? Considering the fact that half of the Sun's energy that reached the Earth is responsible for driving the photosynthesis of the plants growing, and that plants store about 130 TJ energy every second through photosynthesis (that is, their power is 130 TW, hardly seven times the humans' primary energy use), we find we should handle this carefully. The tapping of solar energy shall certainly not be increased significantly, because that would be an excessively strong intervention in the order of nature, as this would involve the transformation of the main force creating and shaping nature.

The utilization of the solar energy reaching the Earth is limited also according to another approach (independent from the above, based on the greenhouse effect) (Meadows et al., 1972). That is, if 5/10,000 of it (three and half times the current energy usage) is freed up as surplus – in any clean ways –, the Earth's average temperature will rise by appr. 1 °C (Gyulai, 2010).

Environmental impacts of energy production and usage

The environmental impact means all consequences of human interventions in the environment. As the consequences of the human interventions in the natural processes are non-linear and very long term, the environmental impacts are hard to estimate. I would recommend taking the intensity of human activities (intervention in natural processes) into account, as that provides a fairly accurate amount of the produced and used energy. We should classify environmental impacts related to the production and usage of energy in accordance with the rows of Table 3.

The environmental impacts related to the production (extraction, collection, capturing) of primary energies from the environment imply mining in case of stock-kind terrestrial energies, and usually surface transformation in case of flow-kind energies. Considering the fact that the territorial energy density of flow-kind energies is low, large areas will probably be used. Mining is also necessary for some capturing tools: the production of wind turbines and solar panels requires the intensive mining of rare earth metals. On the other hand, biomass (especially bioethanol and biodiesel) demands a huge water intake (and CO_2-intake). Non-conventional hydrocarbon production implies a higher risk, mainly due to the possibility of contaminating strategic (underground) waters (Papp–Parragh, 2015).

The transformation of primary energy into secondary energy is very specific, depending on the type of energy source. For example, the transformation of fossil energy types into electric energy is carried out through a chemical reaction (burning), generating heat and CO_2 (and, in case of hydrocarbons, also water), and heat is converted into electric energy – with limited efficiency. Fission ("fissile") energy is converted into heat and then – with a

certain efficiency – into electric energy. Regarding greenhouse effect, there are no emissions involved here, but they must take care of preventing the release of radioactive materials. The conversion of secondary energies into tertiary energies (i.e. supplying them to the consumers through sea- or land transport, pipelines or power lines) also imposes a burden on the environment. The conversion of tertiary energy into effective energy involves the generation of heat, and the end usage causes direct changes (mechanical, work, heat, light). Humans have transformed about half of the original surface of the continents, partially irreversibly, while producing, converting, and "utilizing" energy sources.

We do not know about a fully comprehensive comparison of the environmental impacts occurring during the production of various energy sources. A comparison was made only regarding the so-called climate protection (primarily CO_2-emission) (Láng, 2008). CO_2-emission (by which we try to estimate the extent of human intervention in the greenhouse effect, among the environmental processes) is really one of the possible measures; however, there are numerous other consequences (water-, soil-, air pollution, and other nature destructions) to be taken into account – as can be seen in the list. It would be impossible to take all of these into account and compare them, since the environmental consequences of the production of various energy types are too specific. For example, we can consider a nuclear plant as potentially dangerous; but the overuse of biomass energy would surely be destructive. In the generally accepted definition of the R risk, $R = W \times K$ – where W ($0<W<1$) is the probability of occurrence, K is the severity of the consequence. In the nuclear plant case, the consequences of a low-probability incident can be severe, and in the biomass case: the possibility of occurrence of even "slight" consequences is 100%, i.e. $R = W \times K$ may be greater than in case of the nuclear plant case. (All nuclear plant accidents are attributable to human failures, and could have been avoided with greater care.) In Chernobyl for example, the combination of several small, untreated problems led to the explosion; while, in the case of Fukushima, the invited experts – perhaps deliberately rather than mistakenly – previously stated that such a tsunami might occur only every 10 thousand years, which led to the "omission" of this possibility during the dimensioning of the plant. But a tsunami of this scale (15 m high) may in fact occur there hundred times more often (appr. every 100 years); so they should not have saved money on that during the construction.

The Energy Research Center of the Hungarian Academy of Sciences (MTA) − which was established through the 2011/2012 reform of MTA's research network − and one of its institutes, the Energy- and Environmental Security Institute systematically studies the environmental impacts and the systems of energy conversion. We think − in the frames of an academic committee (Németh et al., 2014) − that the overall environmental impacts of the production of various energy types primarily depends on the amount of produced energy, and not the type of the energy source. Therefore, the environmental impacts related to the production of various energy types can be well estimated from the share of energy types themselves in the energy portfolio.

Taking primary energy into consideration, the intensity of human activity is characterized by 18 terawatts power. By using this huge power, human beings do the following activities: transformation of continent surfaces, pollution of waters, soil and air, influencing the climate, depletion of natural resources (both raw minerals and energy sources), increasing the number of nature-humanity interactions called "natural catastrophes", the global trade (leading to species invasion, biodiversity and ecosystem collapse). There are different effects

in different parts of the world. While the major part of mankind has to live in every growing misery, the Western people have reached a comfort level which even causes physical and mental damage to them, and they still demand more products and services.

Driving and pulling force

Even though energy is the "driving force of civilization" (Szergényi, 2015), it is not the energy sector that is responsible for growing energy usage. Energy is the driving force, and the global consumption, having an endless demand for growth (the total consumption of more than 7.4 billion people), represents the pulling force.

The consumption demand for goods keeps increasing, but the available natural resources and the humans' living space on Earth are finite (Boulding, 1966; Szarka, 2008; Vida, 2009; 2011; Szarka–Brezsnyánszky, 2012). Therefore, economic growth – if further coupled with increasing energy- and material usage – is leading to an inevitable disaster: either due to the depletion of resources or the destruction of the environment. Consequently, the current human lifestyle cannot be continued for a long time. Due to the above, the growing (or perhaps the current, already high) energy demand should not be met anyway – in addition to the fact that it probably cannot be met in energetic aspects.

So, the issue of energy – and environmental security is dominated by the ever growing tension between endless growth – and finite nature. Jared Diamond lists a number of historical examples for local collapses that occurred due to insufficient resources and/or the destruction of the environment (Diamond, 2009). In the next part, you will get an insight into views regarding global collapses.

Endless growth?

The possible shortage of natural resources needed for growth has been known since the end of the 18th century. Malthus (1798) visioned a catastrophic end in his study about the laws of demography – based on the assumption that food production grows by an arithmetic progression, but the population grows by a geometrical progression.

The expansion of energy sources (coal at the industrial revolution, and then later petroleum and natural gas) improved the possibilities. Of course, there have always been critical opinions (e.g. Adams, 1907). Energy consumption per capita was first considered a key parameter by Ackerman (1933). An American geophysicist was the first to warn the world of the finite nature of fossil energy sources. According to Hubbert (1949), if the energy usage per capita is not decreased in an orderly manner (with consumption consolidating at a much lower level at the end), there will be a collapse after a quick ramp-up. The possibility of overrunning and then collapsing in the world's economic-, population-, and ecologic dynamics – in accordance with system theory – was first demonstrated by Forrester (1971): "The greatest challenge is the management of the transition from growth into balance. Folklore and success stories celebrate growth and expansion; but that is not the way of the future." The report of the Club of Rome was released a year after Forrester (1971) (Meadows et al., 1972). The report warned that if the tendencies of the 1970s are maintained in regard

to population, agricultural production, natural resources, industrial production, and environment pollution (i.e. the endangering of the biological balance of the biosphere), then a steep decline shall be expected. Both of these works were accepted by a flood of criticism. Nordhaus (1973) accused Forrester of using groundless data, and therefore rejected him. About the report of the Club of Rome – as Kocsis (1976) summarized various opinions, – they thought "the human goodwill, moral power, not measurable by computers, […] was omitted from the calculation". Growth continued even if the limitedness of resources was pointed out both in geologic (Youngquist, 1997; 1999), and economic (e.g. Boulding, 1986) points of view. According to the puritan (Quaker religion) economist: "Anyone who believes exponential growth can go on forever in a finite world is either a madman or an economist".

The Olduvai theory

Duncan (2001) based the so-called Olduvai theory on the change of energy per capita over time *(e)*. Around 1930, the *e* first reached about one-third of its peak 1980, and a very fast increase started in 1945, which was then followed by a slower increase around 1970. Since 1979, *e* has not been increasing any more. The end of the platform was around 2004, and 2008 was described by Duncan as the brink of an abyss. The *e* may fall back to appr. one-third of its peak in around 2030. So, according to this theory, the life expectancy of the current industrial civilization is the century lasting from 1930 to 2030. The name reflects the Olduvai Gorge in Tanzania (mankind's past- and suspected future stone age life). The author tracks the theory year by year and updates it by analysis of the different situations of economic areas (OPEC, non-OPEC, USA) (Duncan, 2005; 2006; 2007a; 2007b; 2009; 2013; 2015).

Considering the fact that the "most useful" energy is the electric energy (available everywhere thanks to the networks overarching continents, and we use it as freely as we can); according to Duncan, the greatest risk is that the safe operation of high-voltage networks might become impossible. If there is nobody to maintain energy systems, then there will be ever longer and broader power outages. According to Duncan, this phenomenon might be a direct cause of the collapse of the industrial civilization – even if it seems banal. Analyses made around the thirty- and forty years anniversary of Limits to Growth (Meadows et al., 2004; Lovelock, 2010; Bardi, 2011; Randers, 2012) are similarly alarming. The lack of investment funds is also mentioned by the Club of Rome (as an indirect, delayed effect cause). Worries about disinterest in investment were expressed also in an EU report in the Spring of 2016 (Alphandéry et al., 2016).

Our Future on Earth

Instead of sustainable development, the concept of *resilience* is coming to the fore. Many works (Milleneum Ecosystem Assessment, 2005; Baddoe et al., 2009) have been published about the fact that human activities are plundering the Earth's natural reserves, burdening the environment in a way that endangers the survival of the future generations in our planet's ecological system. The aim of the *Future Earth* program of International Science Council

(ICSU) launched in 2014 is to "summarize the measureable consequences of global environmental changes, and provide credible information for the understanding of possibilities of sustainability and the definition of the necessary steps".

Unfortunately, we cannot stop the reduction of the exploitation of natural resources, and shocks are sure to come. Experience shows that in the end, technological improvements demand more and more energy and materials – contrary to expectations and promises. (According to the Jevons paradox[2]: if technological development makes the use of a resource more efficient, the speed of use will not decrease but increase.) In today's perspective, I think that the situation is unsolvable, even by the circular economy (Stahel, 2016). According to Turner (2014) it is time for preparing for the collapse of the global systems, instead of trying to avoid it.

It is becoming more and more certain that – in spite of politically correct opinions – we are heading towards a totally new, unknown, and much harder world. This is exactly preceived, among others, by Náray-Szabó (2006), Almár et al. (2011), Boia (2014), Szergényi (2015) and also Végh (2016).

Environmental science, and even the views of decision-makers have been dominated by a paradigm evolving in the past two decades, according to which the greatest problem is the "global warming caused by CO_2-emissions", and the climate change is in the focus of environmental problems. It seems that the whole energy policy is subordinated to the aspects of "climate protection"; but that is only one of the environmental indicators, and not the most important one: it is like a fever symptom of a patient having cancer. If we go on focusing only on climate change, we will surely not realize that the main threat to mankind is the ever growing global consumption demand, the economic growth itself (Szarka, 2008; 2010; 2012; 2013; Szarka–Brezsnyánszky, 2012; Paulik, 2016). Useable energy-, water-, soil-, and mineral raw material reserves are finite, and the future of energy supply is more uncertain than ever before. We should not believe that the destruction of the environment can be stopped by controlling only one environmental indicator (e.g. a CO_2-emission). The belief that the current level of comfort can be maintained by the so-called "green economy" is also a misconception.

Inequalities

One reason of the increase of global consumption is the growth of the population, and the other is the increase of consumption per capita. In the period 1912–2012, the population of the Earth increased to about fourfold, global energy consumption to more than twelvefold, and production to twenty times! If the energy use per person *(e)* was expressed by the work ability of humans (taking 60 W and 7/24 mode in account), today it is as if everyone had one hundred imaginary slaves. It is one thousand in Trinidad and Tobago, five hundred in the Arabic sheikh states and the United States, and two in Afghanistan – these make an average of one hundred. So, inequalities are huge. What's more, consumer mentality is growing even in poor countries. The Western civilization is not reducing consumption, instead, we see masses of people joining in global consumer society. What about those following the

[2] See for example: Lovas (2012)

conservative values, remaining at their place? The inequality of natural resources is also expressed by the fact that a few dozens of people are together as rich as the poorest half of humanity in total (OXFAM, 2015).

A natural science (microbiological) experiment related to the "Momentum program" of MTA showed a nightmare about a possible globalization model. "Selfish" and "cooperative" bacteria living partially separated, in fragmented living spaces, both survived (with domination of the cooperative bacteria). When the living spaces became less and less fragmented, the "selfish" became more and more dominating. Opening the living space into one homogenous living space, the selfish bacteria killed the cooperative ones, then they started eating up themselves (Hol et al., 2015).

The energy- and environmental security of Hungary

To develop the steps for energy security of Hungary, we should know not only the global background processes, but also the natural resources, and within that the energy reserves and future energetic possibilities of the country. In Hungary, the number of imaginary energy slaves is about two hundred, twice the world average. Our homeland belongs neither to the poor nor the richest countries: we are slightly over-consumers.

Of course, environmental impacts related to the production of energy sources and energy usage inevitable occur. Thus, the greatest potential lies in energy saving, which shall include not only the reduction of wasting but also the reduction of unreasonably increasing demands. Of course, this approach must not be limited to energy, it shall prevail also regarding freshwater, soil (food), raw materials, all products, and wastes – in order to preserve the natural environment.

The energy situation and possible ways

First of all, let's have a look at Hungary's mineral fuel- and fissile material reserves according to the Hungarian Mining and Geological Office (Hungarian Mining and Geological Office, MBFH, 2016).

Table 6
The data of Hungary's known mineral energy stocks

Mineral fuel- and fissile material	Production (2014)	Geological reserves (2015. 01. 01.)	Exploitable reserves (2015. 01. 01.)			
	Mm^3	kt	Mm^3	kt	Mm^3	kt
Conventional petroleum		616		232.397		21.545
Non-conventional petroleum		10^{-1}		418.947		45.643
Conventional natural gas	1943.11		185.475		73.778	
Non-conventional natural gas	3.17		3.923.342		1.565.354	
Black coal		10^{-1}		1.625.051		*1.915.401
Brown coal		636		3.194.637		2.240.049
Lignite		8918		5.715.122		4.271.037
Uranium ore		0		26.769		26.769

Notes: 1000 m^3 gas = 1 t; exploitable reserves= geological reserves + thinning – loss – pillar;
*Loss is smaller than thinning

Geothermic energy exploited in 2014: 2,078,001 GJ. Hungary's geothermic geological reserves (technical potential): 100 ZJ (Mádlné Szőnyi, 2006)

Source: MBFH (2016)

The energy strategy of Hungary is known from NFM, 2012. The most comprehensive and scientifically valid updates were summarized by an ad hoc presidential committee at the Hungarian Academy of Sciences (Lovas, 2012), and the academic journal *Hungarian Science* also published a number of studies (most of which include papers presented at conferences organized by the Energy and Environment Sub-Committee of the MTA Environmental Presidential Committee). Several hardly accessible and therefore less known summarizing works have also been prepared (e.g. Benkő et al., 2012).

Hungarian coal reserves are relatively high (lignite, brown coal, black coal can be found), coal supplies per capita are 2 to 6 times the world average (Kovács, 2013). Nevertheless, the rate of coal utilization has been significantly decreased and – as stated by Kovács (2013) – that is contrary to the world tendency and the intention of reducing energy dependence. Coal would be an especially useful energy source in crises, Practical experts (e.g. Verbőci, 2010; Gagyi Pálffy, 2013) recommend the opening of lignite-, brown coal-, and black coal mines (mainly strip mines), and applying various clean coal technologies. It is doubtful whether the *in situ* gasification of coal should be classified as a clean coal technology. Most of the conventional hydrocarbons have been extracted, and the future extractability of the non-conventional hydrocarbons (e.g. the BCGA gas found in the vicinity of Makó and the methane content of the coal in the Mecsek) has been found as uncertain

at an academic conference (Ádám–Pápay, 2015). Smaller petroleum- and natural gas areas might be discovered, especially if the exploration is made using new geological concepts. Such a research might have realistic chances not only in the field of fossil but also the fissile energy sources. Besides the possible energy source, we should also mention the non-energy ore- and other mineral raw materials, which have a strategic importance but are ignored – unreasonably (Földessy, 2011; Gagyi Pálffy, 2013; NFM, 2013).

The assessment of the geothermal opportunities of Hungary has quite wide boundaries (see e.g. Mádlné Szőnyi, 2006; Bobok–Tóth, 2010). The heat of thermal water can be utilized in local heating, and not much in electricity production. Hungary also has some hot dry (granite) rocks at reachable depth (4–6 km) from where some electric energy can be produced in the future. The spreading of heat pumps would also facilitate auxiliary heat supply (recovering solar energy stored in the soil): with 1 unit of energy investment, 3-4 times of the energy can be recovered. The solar energy (heat- and electric supply) possibilities were last summarized by Farkas (2010). (In the Summer of 2016, another academic conference was held about this theme.) The contradictory situation regarding wind energy was described by Szalai and et al. (2010). Energetic experts find the introduction of electric energy generated through solar and wind energy to large networks unreasonable when there are no proper energy storage possibilities (e.g. water reservoirs). Dinya (2010) reviewed the possibilities and limits of biomass-based energy production as a part of the so-called sustainable energy management. Regarding hydropower, there is a huge contradiction between the Hungarian approach not willing to use the rivers' energy and the practice of the world around us (Szeredi et al., 2010; Fáy, 2013; Gerse, 2014; Ijjas, 2014; Mészáros, 2014; Németh et al., 2014; Szeredi, 2014).

Apart from the Paks nuclear power plant, the Mátra lignite power plant, and several gas-heated plants, we do not have any electric energy capacities at our disposal. The sources of electric energy import are Ukrainian, Polish, and Czech (mostly outdated) coal power plants, which cannot be counted on in the long run. In order to increase our electricity production capacities – considering the fact that Hungarian renewable energy sources are more suitable for heat supply than electricity production – Járosi (2010) and the Energy Policy 2000 Association (2015) recommends the construction of nuclear plant units and gas turbine plants as soon as possible. They consider these necessary in order that renewable energies may play a significant role in the Hungarian electric energy system. Thus, the expansion of the Paks plant does not exclude renewable energy plants. I think that there are no realistic alternatives of the Paks expansion, even if some people recommend other things (e.g. Lechtenböhmer et al., 2016). For the security of electric energy system, all other possibilities (e.g. coal and hydropower) can be rethought in the long term; and at the same time, renewables are recommended to be used for meeting local, scattered demands.

Most (more than two-third) of the domestic heat energy demand is covered by import (mainly Russian gas). In heating supply, the most important task would be the replacement of import natural gas by local energy sources. The MTA Environmental Presidential Committee and other professional organizations have elaborated a concrete plan for that (based on Büki et al., 2014), available on the Internet (Settlement heat supply through local energy, 2015). Table 7. summarizes the domestic energy source possibilities that may be involved in heat supply. This program would cost HUF 150 billion/year for forty years, half of which would be covered by subsidies.

Table 7

Objectives, determined by the academic conference: Settlement heat supply through local energy (2015)

	Units realizable yearly	Units realizable in forty years	PJ/ year	PJ/ 40 years
Earth heat (by heat pump)	10,000	400,000	1.2	48
Biomass (including waste)	20,000	800,000	2.325	93
Solar energy	25,000	1,000,000	0.25	10
Total	55,000	2,200,000	3.775	151

Source: Settlement heat supply through local energy (2015)

By the involvement of local energy sources, the energy structure of Hungarian heat supply is forecast as follows (in place of current values stated in parentheses): geothermic 18% (1.2%), solar: 4% (0%), biomass (including biogas and wastes): 47% (11%), natural gas: 31% (87.8%). Communities' energetic developments might mean a good opportunity for the development and production of innovative products (e.g. heat pumps, biomass boilers) which are competitive in international markets.

Energy security considerations

Even if some warn about our lack of energy sources and vulnerability (e.g. Reményi, 2009), there are possibilities to decrease the portion of import energy (on the one hand the reduction of energy demand, and on the other hand the extension of energy sources). Steps to be taken for energy security shall obviously be determined by taking the international environment into account. A decade ago, Varró (2007) focused on the strengthening of international relations instead of aiming at self-supplying: "the main task of energy policy is therefore to properly manage international relations, and not pursuing autarky".

Forward planning involves the understanding of the possible processes of the future, including considering the worst scenario. From this point of view, the high ratio of electric energy import and the huge amount of natural gas import both mean a significant supply security risk and even jeopardize the survival of Hungary among tolerable conditions. The recommended guiding principle for Hungary is partial fragmentation – not only in the field of energy security. The most important might be to put an end to the illusion of security. For these reasons, the further increase of state involvement is inevitable.

The energy situation of the European Union is very fragile, and it is questionable that pursuing only the energy union and the European energy- and climate policy principles contributes to the energy security of Hungary. We must emphasize the need for cooperation with countries and regions that have own energy sources. It is also possible that the value of basic natural resources will be more appreciated than high technology in the future!

Hungary has a huge potential in energy sparing, rationalization of energy usage, and change of consumer attitudes. We should use our natural resources (both stock- and flow-kind energy sources) taking our real possibilities into consideration. The energetic utilization possibility of geothermic thermal water is rather heat supply and not electricity

generation. Focus should be put on local use (instead of large-scale biomass production, which is doubtful in energetic regards) in case of bioenergy, local usage or timely more consistent production in case of wind energy (e.g. through water storage), the enhancement of the local supplementation role in case of solar energy, while regarding hydropower there should be a total re-thinking without any politics involved (Németh et al., 2014). In my opinion, decision-makers should ultimately decide whether the goal is to create a better energy security needed for the vital interests of Hungary, or to implement the energy- and climate policy forced by external entities.

Environmental security

Among measures taken for energy security, only the saving and reducing ones will have favorable environmental effects. The environmental impacts of energy production will be negative in all cases. Pursuing the so-called "circular" economy might only somewhat mitigate the rate of deterioration.

There are natural disasters that are independent from humans, since we live on a dynamically changing planet. According to the general definition, a natural disaster is an event occurring due to natural causes, suddenly and significantly negatively influencing the living circumstances of a large number of humans or other creatures for a shorter or longer time, and occurs unexpectedly and unavoidably. In fact, among the various natural disasters, there are ever more biological, geophysical, and hydro-meteorological disasters which are the long-term, non-linear consequences of human intervention in the order of the nature. Namely, there were induced earthquakes due to the dam at the Nile at Aswan, the geothermic power plant of Basel, and the formation fracturing gas production in the Netherlands. Similar long-term effects are caused by the drying due to groundwater utilization, flood level rise due to the reduction of rivers' flow cross section (Schweitzer, 2011), the increase of flood risk due to clear-cutting of mountain forests. The increase of the number of natural disasters in the past one hundred years is due to this kind of causes (and not or not only the climate change).

The list of natural dangers below shows that you cannot always clearly distinguish real natural disasters from induced ones. Temperature extremes, droughts and floods are common phenomena in Hungary. Due to water regime, inland water, slop, bank erosion may occur, and there may be significant mass movements as a result of water flow (landslide, flowage, bank collapse). Unfavourable geological conditions (swelling clay, peaty areas, drift sand, caves, solifluction or liquefaction) may cause local damages. Underground peat- and coal fires might cause problems, too. Due to fluid mining, there may be regional surface subsidence; and due to basements or mines, there may be local surface collapses. The risk of volcanic eruptions is not significant in Hungary, but there may be CO_2- and methane release due to post-volcanic (or hydrocarbon transformation). Natural background radiation (Rn, Th, U) significantly exceeding the average level occurs at some places. According to experience, strong earthquakes causing huge damages (with a magnitude of 5.5–6) occur every 40–50 years. (The last such great earthquake – of a 5.6 magnitude, VIII intensity – happened on 12 January 1956 in Dunaharaszti.) The construction of earth and/or satellite monitoring *(early warning)* systems should be considered.

Summary

Mankind shapes the environment by 18 terawatts (TW) power today. We go on using up natural treasures, taking the place of nature, polluting water, soil, air, inducing disasters we call "natural", transporting natural resources and products (including invasive species) globally from one place to another, collapsing biodiversity and the ecosystem. Through these, we of course influence – among others – the climate. The so-called "developed" world has reached a comfort level which even causes physical and mental damage to them, but due to the consumer attitude they still demand more products and services (and thus more energy). Since the industrial revolution mankind has used at least 30 ZJ energy, almost as much as can be taken from the current total fossil energy stocks of the Earth − according to certain data. Nevertheless, the tremendous power of nature is indicated by the facts that (a) the energy of one single strong earthquake may be as high as 40–50 ZJ; (b) the total energy of the sunshine reaching the Earth is almost ten thousand times our current energy usage. The views regarding the unlimited possibilities of renewable energies is based on the latter fact.

In my opinion, in this theme, there must be no techno-optimism. Due to the fact that renewable energies have a small territorial energy density (and technical issues related to the huge energy demand unsolved); only a very small part of the sunshine reaching the Earth may be taken away from the nature without consequences. Moreover the energy sources may be any "clear", the environmental impact of energy use will still primarily depend on the amount of energy and not the type of the energy source. Namely, all energy types have a disadvantage or environment damaging effect. Historically, the effect of fossil fuels was air pollution (today the CO_2-emission is also considered as "air pollution"), the effect of nuclear energy is the risk in operational safety, and the effect of renewables is the need for large areas and the complicated technology (including the need for special mineral raw materials). Ultimately, the produced energy will be converted into nature shaping work and heat – regardless of the type of energy. The so-called renewable energies at a scale similar to the current fossil energy (if possible at all) would be similarly destructive to nature as the conventional energy types.

For the condition of the natural environment, the only effective measure could be the drastic reduction of energy use (thereby immediately reducing also CO_2-emissions – according to the burning reaction equation of fossil energy sources). The growth demand of the consumer society is infinite. We can envisage the encountering of natural limits as an inevitable disaster, perhaps a fast collapse. There is a global fight for still available natural resources, disguised by various means (not least by distraction about the CO_2 risks and overestimation of green energy sources). Unfortunately, the "green idea" has become a server of business circles, because it hides the causal link existing between the scale and intensity of human intervention into natural processes (energy usage continuously growing since the industrial revolution) and its consequences (the *Global Environmental Change,* GEC).

The situation is unsolvable, as nobody will withdraw voluntarily. That is why the future energy security of Hungary depends on the availability of enough and securely accessible (preferably local) energy sources. Besides energy sparing (including the reduction of demands), the conservation of nature is a very important aspect but difficult to achieve. Instead of consumer attitudes, we should perhaps pursue the aim set down in the Book of Proverbs: "Give me neither poverty nor riches; feed me with the food that is needful for me!" (Proverbs 30:8).

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Valéria Csépe

The Psychological Dimensions of Subjective Security

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Abstract

This chapter focuses on the psychological dimensions of the societal factors of security that cannot entirely be explained by the classical information processing theories. The primary reason for that is the significant change seen in the 21st century in the individuals' place in the local and global social space. Technology, developing more rapidly than the human cognitive evolution, has modified the territories and methods of the individual, the societal space and empowerment, as well as the ways freedom and power are exercised. The so-called knowledge-based society requires new skills in an era when the decades-long stability of knowledge is cracking and new skills evolved that can hardly put under conscious control.

The personal, or subjective, security dimension, therefore, plays an important role in understanding the detachment of environmental challenges and cognitive developmental scale including the separation of attention, memory, learning ability and emotional processing. In this approach, the newest data of neuroscience provide a new insight into the effects of the global web on individuals and on the processing variations associated with the advent of virtual spaces. This chapter describes those security issues which play a significant role in the individuals' perception of threats and risks. To illustrate this from the aspect of the biologically, psychologically and socially determined individual, I shall outline the conflict areas of objective and subjective safety typical for the 21st century to discuss those already well-identifiable changes which must gain increasing importance in defining security and safety.

Keywords: globalization, information processing, digital word, knowledge society, threat perception, risk evaluation, cyber-crime, cognitive and affective components, subjective evaluation, vulnerability, threat-insensitivity

Introduction

The notion of security has changed a lot over the centuries. At the beginning, the conception aimed at understanding mainly the actions within objective security. Though the classic security policy distinguished between the objective and the subjective security already in the sixties, it came to the fore in its true depth and diversity only in the past decade. Although this study is not aimed at providing a historical overview, it should be mentioned in respect to subjective security that its themes have been noted in the foundation of security policy for decades now. Most experts agree that the breakthrough of a significant conceptual renewal of the security issue happened at the end of the Cold War; and the further development of this notion is affected by strong compelling forces today. The security policy discussions of the 1990's brought forward for the first time the new approach, being also new in philosophic aspects, that took the dual models of prevention and compensation as a basis in the solution schemes of dangers originating from basically social and technological uncertainty.

The lack of social and technological security is becoming a serious risk factor in the 21st century, but one of the main problems related to the knowledgeable management of this risk is that it cannot be classified as a risk solvable by law enforcement or political means. Globalization and digital revolution bring different changes with regard to subjective security. Becoming aware of the negative events associated with globalization has led to the weakening of the sense of security in the past years. The perception of specific threats has been complemented by an anticipation of abstract dangers at a high degree which have various psychological aspects, and demand skills different from handling of traditional security issues. The expansion of the digital world does not have a satisfactory impact on the individual behaviour, so that the subjective sense of security is unreasonably good – in spite of the fact that the dimensions of the digital world's expansion are the same as of other fields of globalization, and are serious factors in security policy. The low level of threat perception of individuals does not or does only hardly change the perception of the risk associated with digital globalization, does not influence the subjective security; even if it may be considered as a serious objective security risk. These are two opposite processes, and their factors and causes should be urgently and deeply explored. It may be surprising that the general phenomena of globalization reduce the subjective sense of security, while the effects of digital risks, which also have globalization-related phenomena, are not significant. The unreal sense of security and the underestimation of hazards endanger many population groups, but mainly the teenagers, who ever more widely and often use the smart devices of our age. Another, separate question is whether the today's generation of teenagers uses these devices at a high level, and whether the proper skills required by these devices are supplemented by conscious application; and whether this development, overestimated by some scientists, have measurable indicators.

The conception of security is different from the conception of even a decade ago; as – instead of defense against a concrete threat or danger – we expect security policy that can get prepared for risks appearing at a higher and more abstract level. This means that *we treat security as a social value, a generally applicable normative criterion.* So, today (at least in the western-type democracies), security is a political value without any independent meanings interpretable in itself, i.e. it is connected to the values of the individuals and the society. This connection also makes clear that modern security policy, taking many

aspects of security into consideration, shall be created, which can interpret and implement the (historical, cultural, religious, social, etc.) processes of the society and the factors that influence the individuals' subjective sense of security.

In the definition of dangers, mainly the threats and the challenging risks appear (frequently as synonyms) in the concept of vulnerability threatening security which is used widely and with various meanings. The first point of the concrete assessment will deal with psychological aspects of vulnerability. At the same time, we should note that the definition of vulnerability and the management of the resulting risks has a great importance both in security policy- and special policy aspects, due to the individual- and social-level determination. Two characteristic issues of these will be highlighted, which have been significantly changing in the past years, and have different intensities regarding the subjective sense of security and risks on the level of the individual. One is the negative effect of globalization on general subjective security, which is – in the absence of appropriate informedness – anxiety-increasing; and the other is the unreasonably high threshold of the perception of subjective security during the everyday use of Internet and smart devices. This is why greater emphasis is put on these new risk factors, in the perspective of security.

Globalization, information technology, knowledge society

Globalization is a multidimensional phenomenon, and there are certain areas in it where the understanding of processes necessitates deep know-how covering several areas of knowledge. The integration of the know-how attained in the different specific fields would be important for security policy considerations that are opposite to strong specialization, as well as for the topic of this study: the subjective security. It seems that the experts are hardly willing to undertake that, which may result from the fact that the methodology of this – quickly developing but still very young – scientific field, which has the task of revealing the human behaviour that indicates the changes and the psychological dimensions of subjective security, is incomplete.

In the past years, the every-day appearing of changes related to globalization, the perception of risks and threats, and the understanding that global and local phenomena go together have been linked with crises (economic, financial, and political), disasters (industrial, natural, hybrid – that is industrial disasters resulting from extreme natural phenomena), local wars, revolutions, cross-border terrorism. Today, several of the more complex phenomena of globalization (economy, climate, environment, etc.) are perceivable on the level of individuals; and – even if there is no deep knowledge – also the concrete (extreme weather) and the abstract (environment and sustainability) sense of danger is increasing. The largest negative shifting in individual security perception – i.e. in the subjective assessment of threats and risks – or, in other words, the diminishing of subjective security are mainly linked with the concrete facts of globalization: over-population, the shrinking of natural resources, the new migration that has started due to wars and unhuman living conditions, and dangers which are known but hidden from our perception (food- and water scarcity, etc.), international crime, and terrorism. Info-communication devices carry tragedies, terror, and environmental threats into our homes and through this into our everyday life;

and the negative occurrences, being almost the only ones that have newsworthiness, spoil subjective security through psychological factors like distress, fear, pessimism, and apathy.

While one of the communication means of the flood of threatening information is the digital world, the subjective perception of the dangers of its use has hardly changed at all. Private persons, and sometimes even political leaders handle their digital devices in a negligent way and fail to protect them from uninitiated peepers or those searching for information with hostile purposes. Thus, we may be surprised that our subjective sense of security related to globalization is significantly decreasing, but it does not change with regard to the use of the digital world. The crises and disasters of the world are not or not yet shocking enough to individuals, and our individual sensibility regarding data security has not yet developed enough. This has several various causes, which will be discussed later. Information technologies (IT) develop quickly and in a wide range, and the circle of the "smartly networked" (by which I refer to *"smart"* devices, and not necessarily the users and the method of use) – similarly to other global (economic, politic) networks – is growing quickly. In the global web, usage has theoretically no limits. The minimum education requirements for everyday use of user-friendly systems (mainly the Internet and the social media) are very low; real knowledge, or a low level of ethical and moral development are not impede presence, the mixing of opinions and facts, or the propagation of ideologies or even fallacies. The false, bad, intolerant, inciting world has appeared also on the Internet – which should serve the free flood of information and opinions, and the correspondence among communities – and, within the expanding web, in the social media. Terror, violence, fraud are communicated ever more frequently on the Internet, and a new branch of crime, the so-called cyber (or Internet) crime has also appeared.

The Internet and our smart devices are not the causes but the possibilities of crime and cyber terror. This tool uses the newest psychological methodology, relies on visualizing personal characteristics, ideological opinion, identity, thinking, and attitude; and the behavioural manifestations of these may pose a threat. Personal qualities become visible just like the qualities of a driver in special or in everyday situations. But the number of people endangered by drivers speeding in the exit lanes of highways is only a fraction of the number of those being influenced, oppressed, or destroyed by the activities of those who rampage on the Internet, offenders, criminals, terrorists or the hackers working for the above, who are often anonym, hardly (or not) identifiable.

The actions we do on the web influence us: they change our information processing, habits, method of correspondence, behaviour; and what is more, if we use the online space in an extreme way (addiction), that will affect even the structure and function of our brain. The specializing branches of psychology – the profession that examines human behaviour and has a dual (helping and scientifically revealing) purpose – have dealt ever more with the effects of new technologies; and the new disciplines, the cyber psychology and even the cyber psychology of criminal behaviour are trying to reveal the human-related features and causes of the phenomena regularly observed in our days. According to a common view in cyber psychology, the Internet space (here as a global, multilayered web), or the cyber space is not only a transaction medium, not the intermediator of passive TV watching of telephoning. This medium, as formulated by Mary Aiken in the book: *The Cyber Effect* (2016), a work considered as standard reference about cyber psychology and psychology of Internet-based crime: "It is a highly interactive, highly engaging, and highly immersive

environment—uniquely compelling and attractive to humans" (Aiken, 2016: 11.). Indeed, the Internet space is full of place names, real and unreal people, and there are billions of people online.

But the world of Internet hides a number of serious evolutionary traps. Evolution has not prepared humans for faceless presence and communication. Our instincts work relatively well in face-to-face interactions, but when we are in the Internet space, these instincts let us down. Our obstruction is clear but our perception is not. According to the current psychological definition, perception is: the result of a calculation (brain process) based on the sensing of current actions, using also our knowledge and former experience for the assessment. We could illustrate this by a situation where you have a car key but you cannot drive. In the world of Internet, our evolutionary behaviour set does not work or works improperly. Moreover, this world is both a real and an unreal multi-dimensional space at the same time. Cognitive sciences identify Internet as a kind of space where we can find a lot more variations of human behaviour than what we have experienced before: from vulnerable people to criminals, from helpers to people with killing intentions. Thus, during our online encounters, we find the best and the darkest side of human behaviour, and we do not yet fully understand how the Internet world serving the normal population's needs affects the abnormal, deviant, criminal, or vulnerable groups. *This is why the Internet security policy shall presume that the false sense of subjective security* (and the factors besides evolutionary unpreparedness will be mentioned later) *is underestimated at the moment*. That is why the understanding of psychological components would have significant benefits in the estimation of threats and risks; and, together with the objective factors of security, it may result in a more complete preparation.

Information processing and emotions

The past two decades of brain research, basically transforming our knowledge regarding the relations of perception and affective and cognitive processes, had two significant outcomes that affect also the subjective security. Firstly: information processing is the result of not an intended cognitive process but an unintended neural process. Our brain is able to process about 10 millions of information units per second, whereas only 40 units are processed intentionally. The processing of the rest happens through unintended brain processes. Secondly: emotions play a primary and dominant role in perception and thinking. That is why the results of emotion research have an ever growing effect on the wide-range analysis of the above-mentioned global issues: nuclear proliferation (Hymans, 2006), combatting of terrorism (Saurette, 2006; Crawford, 2009), retaliation as an answer to threats, war motivation (Lebow, 2010).

To understand the effects of the emotional reactions influencing security and the rational answers to be given to risks, we should first make clear what is an emotion. This question is subject to a wide range of debates even today. These are not going to be discussed here, but here is a quotation of a definition well picturing the scope and complexity of emotions: "emotion is a combination of components, made up by biologically determined (physiological and psychological), and physical and socio-cultural systems, and defined through transformative interactions" (McDermott, 2004: 692.). At the same time, we

should note that emotion is a collective term, and within that, feeling, moods, and passion are related to very much different ontological and metaphysical principles. Emotion is made of physiological changes and these becoming awareness. For example, the physiological changes (quick heart rate, sweating) accompany fear even before we would know that we have fear and what made us feel like that. In general, we feel before we would think, and – surprisingly – we act before we would think. Most brain researchers agree that our brain uses automatic processes that are quicker than the conscious, deliberate processes, but the brain interprets these automatic, quick responses as conscious and deliberate.

Psychologists and neuroscientists often use the dual process- and two-factor theories based on the idea that our behaviour is controlled by two systems made up by processes having separate and different accesses and speeds (MacDonald, 2008). One is implicit, automatic, fast, early developed, parallel, effortless, non-reflexive, and high-capacity; while the other is explicit, slow, late developed, sequential, with limited attentional and memory resources, needing efforts. Both psychological and neuroscientific researches suggest that our brain has two separate operative systems: one emotional and one thinking-reasoning systems. Kahnemann (2011) calls the emotion-determined system intuitive and associative, and the other one reasoning, rule-driven. The first processing method, mainly relying on emotional processing strongly influences our responses, and the second – of the two rivaling methods –can hardly "teach" the first one. The emotional processing system can give quick responses to environmental effects, and this effective response – developed during the evolution – facilitates the immediate perceiving of being threatened.

The question is how the two changes being opposite to each other regarding subjective security (concrete versus digital globalization phenomena) influence our decisions in their complex environments. This is important both on the level of the individual and the decision-makers responsible for security. In emotionally stressful situations, danger detection often leads to wrong identification of endangering factors and objects. Under the influence of strong emotional reactions, the overestimation of the danger is significantly higher than its underestimation (Bauman–DeSteno, 2010). Of course, the main question of policy and social psychology goes beyond the evolution-related reasoning. What is the social context in which emotions have a real meaning? What is the common element that influences the decision of the individual, a group, a nation, or a government? What components do we consider threats, going beyond subjective security? We know that the components are varied, and embedded both socially and culturally. Nevertheless, the strongest driving force is fear. More deeply analyzing how the various science branches define fear would not be worth herein. But we should note that, according to neuroscientific research, fear can not only be conditioned, but can also be permanent or last longer than any other learned (conditioned) relations. This is why there might be a contradiction between objective risk and the factors causing fear, and this might be so great that it causes the overestimation of the risk and the significant decrease of the sense of subjective security. That is why fear may last a lot longer than the threat, and may be embedded in the behaviour of individuals and groups as a long-lasting learned response.

However, on the level of the individual, the factors to be considered in the assessment of threatening occurrences differently influence the subjective sense of security. This is illustrated by the model jointly dealing with threat and the possibility of becoming a victim, presented by Table 1. In the interpretation of the model, we must take into account that,

on the basis of the measured empiric data, the definition of subjective security is far not as clear as the table shows. In the light of the measured data, the subjective experiencing of being threatened, the evaluation of the possibility of becoming a victim may be better understood in two dimensions, on the basis of cognitive and affective components. The perception of subjective security is based on three important, potentially relevant pieces of information, accessible on the level of the individual (Jackson, 2005; 2006). These are (1) a possible event affecting security, the risk of involvement/becoming a victim ("What can happen to me?"), (2) physical, material, and mental consequences ("What effect will that have on me?"), (3) the concrete probability of involvement/becoming a victim ("What are the chances that it will affect me?"). In this regard, as I cannot emphasize enough in this study, both the cognitive and affective aspects influence the subjective perception of security.

Besides the subjective evaluation of all these aspects, we can also practically define an objective risk, which might be considered real, even though it cannot be presented in a breakdown to endangered populations.

Table 1

Possible variations of the concept of subjective security

	0% … Cognitive components of subjective evaluation … 100% objective evaluation				
	100% … Affective components of subjective evaluation … 0% subjective evaluation				
Possible event	N	Y	Y	Y	
Implications	N	N	Y	Y	
Likelihood					
Psychological condition	Distress	Uncertainty	Uncertainty and worrying	Subjective risk perception	Objective individual risk
	Anticipating	Anticipating	Anticipated	Anticipated	
Security-relevant denomination (criminology)	Loss of security	Fear	Subjective probability of becoming a victim		
Possible indicators	Physiological indicators	Questionnaires (psychological tests)	Specific questionnaires	These indicators are usually not included in the security statistics	

N: factor ignored by the individual; I: factor taken into consideration by the individual

Source: Jackson, 2005

The consequences of continuous loss of security are serious, may last for a long time, and lead to the condition of permanent feeling of threat. The cognitive and affective aspects considerable on the level of the individual are manifested in the anticipation of fear. This is further strengthened by the learned fear response, and may lead to events with extreme consequences (see the terror attack against the New York Twin Towers 11 September 2001). This extreme loss of security amplifies threat perception, and the threat-intensive condition may last for years, or even longer than a decade. The threat can of course be institutionalized, turned into program of governments, and the mass diminishing of subjective sense of security may generate conflicts. That is why emotional processes must not be ignored neither in the evaluation of subjective security, nor in the estimation of risks. Moreover, emotions play a role also in the assessment of reliability, since they influence the two main factor of that: the interpretation of evidences and the evaluation of risks (Mercer, 2010).

In summary we can conclude that emotion is an assimilation mechanism that influences the choice and the interpretation of threat perception. This is why we should not ignore emotional components when we determine the individual's subjective sense of security. The interaction of rationality, cognitive heuristics, emotional states, and the political- and institutional context shall be incorporated in these strategies.

Vulnerability and risk

The notion of vulnerability – in the context of security – is mostly mixed with the expressions: *threat* and *risk*. Vulnerability means roughly the same related to both humans and things (e.g. an information technology system), and its level determines the likelihood of being attacked. The notion of danger is also linked to this. Everything that deliberately or accidentally takes over, causes damage, or destroys – using vulnerability – is a danger. This is true regarding the individual's physical and subjective reality and also regarding objects. Objects are meant in a wide sense here, from software to concrete objects. So, whether related to a person, an object, or a system, vulnerability is the weak point of any efforts for security. Risk is the root of these two, so it can be assessed on the basis of the determination of vulnerability and the evaluation of danger. In general, low vulnerability also means low risk. But we should overview in short what risks the individual's vulnerability means.

Psychological vulnerability is inherent in human life, but its level can be quite various. According to the relevant research, an elevated level may lead to serious psychological problems, because a higher level of psychological vulnerability goes hand in hand with the dominance of negative emotions and depression symptoms. On the other hand, a low level of psychological vulnerability shows a close correlation with satisfaction, dispositional optimism, and self-efficiency (Sinclair–Wallston, 1999). Furthermore, several studies have shown that the level of spiritual vulnerability and that of conformation are correlated, and this influences subjective welfare, satisfaction, and subjective security, including societal security (Satici et al., 2016; Uysal, 2015). So, spiritual vulnerability is a part of the subjective security which – as a personal quality – influences the individual assessment of objective security.

However, vulnerability can be defined not only as an inherent personal quality but also as a consequential – i.e. changing due to environmental impact and through experi-

ence – individual quality. The digital revolution is accompanied by negative consequences> most of the web-users – including those who are highly psychologically vulnerable – do not care about the security of their private sphere, carrying risks that may go far beyond the individual's security leading to business-related or even to national security risks. Today it is self-evident that many human activities – e.g. correspondence, social interactions, entertainment, shopping, search for information – are carried out online, and their medium is the segments of the digital world which have varying security controls.

Danger insensitivity of individuals

Activities on the Internet have a trace, an undeletable trace. The indicators accessible on the surface can be easily captured, and analyzed through intelligent computer algorithms, using the knowledge of various disciplines having a deep knowledge abouthuman behaviour. The positive usage of these data sources is related to social science, the services aiming at providing a better service for customers, and also targeted online marketing. By use of well-developed computer programs made for tailored search engines and recommendation systems traceable on the Internet, one can have an insight into the users' plans, wishes, attitude, and even religion and political preferences, or extreme behavioural deviances. The good cause, i.e. to serve the customer, the citizen, is based on the data capturing the individuals' behavioural patterns. This poses a serious challenge regarding privacy and the integrity of private life – even by itself, without a negative will of the data collector. The (Internet-) psychological examinations of the past years have shown that personal qualities, even characteristics we consider as only ours and private can be easily learned through so-called digital behaviour data that seem to be harmless. Getting to know the person's individual- and the groups' common characteristics, intentions, values, attitude itself means "only" the damage of privacy; but in a fierce social-political situation, it may cause serious risks and should be taken into consideration even in security policy aspects. An American study published a few years ago (Kosinski et al., 2013) reported about the results of a survey on the reliability of findings related to several qualities, on the basis of information about almost 60 thousand volunteers. The profile information available in the myPersonality Facebook applications (www.mypersonality.org/wiki), likes (an average of 170/person) were compared with the results of a psychometric test and a questionnaire. The results are not reassuring either regarding the protection of privacy nor security. Merely using the Facebook "like" data, you can find out by 80-90% accuracy personal characteristics such as sexual orientation, intelligence, religious tolerance, xenophobia, emotional lability, aggression.

In terms of security, we can conclude that the identification of vulnerability based on personal characteristics may pose serious risks with regard to the choice of target persons in case of a planned (business, political, etc.) attack. The risk of any kinds of danger may be increased by the identification of the patterns of vulnerability, which is applicable to persons and groups who may become emotionally instable, behave neurotically, be influenceable, or easy to win over to foreign and dangerous ideologies. The digital footprint of Facebook posts can be profiled (similarly to *profiler* activities used in the crime investigations) in psychological aspects, and it is not only a telltale but also a security risk. A huge amount of private data is available, there are no limits to classification and profiling, there

are hardly any digital limitations, and you do not even need the person's agreement for using the information available on the Internet – unlike other kinds of data mining. The user often does not wish to share these data with others, but the conclusions that can be drawn from them may have security risks (for welfare, freedom, life). The analysis of the digital footprint left by individuals and groups – having psychological knowledge and the right mathematical algorithms – facilitates the identification of the main factors of vulnerability. The societies including people who are at a high level of digital development but not yet mature in relation to human behaviour and not prepared for defense should stand up to the real security challenge.

Aspects of threat perception

Danger can be interpreted by itself, primarily because it is mediated by the object, person, or event which carries the danger. Perception is the processing of the dangers felt, resulting in the identification and interpretation of what we have processed. According to classical psychology, perception is a uniform and conscious process that arises from processing by sensors, and is linked to the presence of stimuli. Perception is the basis of understanding, learning, knowledge, and the motivations leading to actions. However, individual perception is not exclusively determined by sensor information, but also by emotional state, information processing, reasoning, and the pattern of meaning-attribution. But on the group level, the identification of perception – including the perception of dangers – is usually difficult. The interpretation and communication of perception is similar to that of emotions, that is why we find its results in the collective moods. In this regard, danger is the social construction which is created through personal talks, the public information given by experts and political leaders, and the communication by communities (Meyer, 2009).

Threat perception has many aspects. In security regard, we usually take the non-psychologic factors into account. If psychological factors are not known, it is difficult to understand the false perception of danger on all levels, whether individual, common, or political. This paper aims at giving psychological explanations for threat perception. In the analysis of the components of false perception, we collate the perception preceding actions *(ex ante)*, with the real behaviour after the actions *(ex post)*. In the standard information processing models, the estimation of false perception as a process is based on the degree of deviation from a rational decision. The question is what shall be considered standard; and how flexible the boundaries are. That is, whether the response to threat perception pursues rational or optimal information search. The starting point of the notion of false perception and false calculation lies in the assumption that there is accurate perception and calculation, and there are standards and boundaries in order to reliably separate them. Unfortunately, these boundaries are difficult to determine, even after the response to threat perception has been given. It would be especially difficult to give an accurate explanation for political-level conflicts. Regarding decisions following obviously false threat perceptions, historians try to find the intention only years later, in possession of all documents. There are many co-existing explanations for why many people – usually those who are in leader positions (business, political, etc.) – communicate false information about their own skills

and intentions. This question would be difficult to answer, that is why psychology dealing with threat perception studies the possible patterns, rather than the accuracy of perception.

Intention and ability

The intention and the ability are the two central elements of danger, threat. Their definition includes many contradictions, in spite of the fact that both are decisive factors in models estimating the degree of threat, as well as in strategies focusing on rational deterrence and the danger perception. One of the causes of this is that although the intention is manifested in purposive behaviour, the psychological researches show that people do not realize the preferences; and one of the basic characteristics of these preference is instability (Kahneman–Tversky, 1979; 2000). The most difficult thing is to estimate complex human behaviour, as we have no concrete, tangible information about that. Such are: morale, motivation, loyalty, and leadership abilities. A separate branch of cognitive psychology deals with the cognitive distortion influencing the patterns of danger perception, first and foremost in order to reveal and analyze the factors appearing in the patterns of danger perception. And a separate research branch deals with the danger perception distortions which cannot be or can only hardly be explained on the basis of rational information processing models.

The "cognitive revolution" – which can be considered a rebellion of psychologists – four decades ago broke away from the simplified explanations of human behaviour. The mind – together with the research about human intents, conclusions, and judgments – was brought back into psychology. The real problem regarding the new, rational models of the popular information processing was that behaviour in real situations could not or could only falsely be determined on the basis of these. Why is that important regarding security? Among others because the perception of danger and threat is influenced by a number of psychological processes, including cognitive processes. Regarding the nature of decisions made in danger situations, we should take into consideration the fact that human cognition is not very good at the estimation of likelihood. We should not forget either, that the response of a bigger social group or a country to a danger is the joint decision of political decision-makers and the security policy, but every participant's information processing capacity is limited, and rationality can prevail only conditionally. As rationality is limited, the reduction of the complexity and uncertainty of the situation may distort danger perception and evaluation, as a result of the quick cognitive estimation of the information. This shortened cognitive process can explain relatively well the false danger perception. A number of psychological studies confirm that human behaviour rarely meet the expectations based on the abstract rational models (Kahneman et al., 1982; Kahneman, 2011; Hastie–Dawes, 2001; Gilovich et al., 2002). The results of cognitive psychological examinations show that decisions made by people are mostly based on estimates and on the ascribing of intentions, instead of using rational models. That is why the demand for easily deductible conclusions significantly increases when processing uncertain, complex environmental information. The source of the cognitive distortion – in complex situations – should be searched for in human thinking; and these are the following: preference for simplicity, aversion from uncertainty and dissonance, and elementary misunderstanding of the essence of likelihood (Tetlock, 2005). Most people have very bad likelihood estimation abilities, which – together with the other

factors – strongly limit the chance of rational decisions. This is particularly noteworthy if we take into consideration also the fact that tall the aspects listed above are only cognitive factors of danger and threat perception – and these factors are influenced by emotional processes, as well as the individual's and the community's long-lasting, learned fears. That is why subjective security can be hardly judged without the knowledge of modern psychology – which in turn often calls neuroscience for help in understanding issues, due to the complexity of behaviour. This statement points far away. It is namely about the fact that there will not be well-implementable security without taking into account the perception of subjective security and the effects of emotional and cognitive factors, nor without the understanding of the opposite processes derivable from globalization phenomena. As a result, some of the results of psychological researches that reveal decisive factors of subjective security have become non-public information, and are becoming a security policy issue.

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Judit Navracsics

The complexity of self-definition for people living with two languages and two cultures

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Abstract

Most European countries have a strong "one language, one nation" ideology, even though they all have national minorities in their territories. However, recently, as a result of international migration, the identity of nation states of the EU has changed. Major changes occurred mainly in the ethnic composition of countries; and in the urban environment, where there is a growth of mixed population, bilingualism and biculturalism are becoming the norm. The use of two or more languages also entails the integration of two or more cultures, which changes the original nation state identity.

The question of identity can be very complex in bilingual and bicultural situations. Each person has the right to decide whether their self-definition is determined by their *ethnos* (i.e. the family ties, friends, emotional attitude, language, culture, literature, homeland, etc.) or the *demos* (i.e. practicing democratic, civil rights, getting on in the society, etc.). The decision is even harder when it comes to bilingual individuals that come from mixed marriages. This paper analyzes that situation from the aspect of bilingual and bicultural individuals. It highlights the importance of the factors that may contribute to the self-definition of individuals and without which the host society cannot offer comfort to immigrants. Individual satisfaction is indispensable for integration at societal and political levels.

Keywords: bilingualism, biculturalism, identity, code-switching, code-mixing, minorities, immigrants, integration

Introduction

In Europe, most of the old nation states have become countries where, besides the majority population, there are also regional or immigrant (recently migrant) communities (Extra–Gorter, 2008). According to Oakes (2001), there was a major change in the relationship

of language and national identity in the 20th century. In the Member States of the European Union, international migration caused a change in the traditional identity of nation states for demographic reasons (primarily in the urban environment).

Two political approaches compete with each other: those dreaming of a unified Europe that supports diversity and inclusion and intend to establish the united states of Europe pushing national identity and characteristics into the background are opposed by the increasingly introverted tendency supported by those who wish to preserve the nation states, keep the national cultures, traditions and habits and emphasize the national characteristics. The contradiction of extroversion and introversion causes numerous tensions, which may reach a dramatic scale when it concerns human lives. Despite the best intentions of both parties, serious conflicts may develop in which individuals may be hurt. These days the "migrant issue" is an obvious example for that. Hungary intends to maintain its nation state status: the official communication conveys a message to the citizens that Hungary belongs to the Hungarians, the country is populated by Hungarians and the Hungarian culture is nourished here. In this communication, giant posters and road advertisements are used, which may have a rather adverse effect on foreign visitors and those who intend to integrate in Hungary.

This situation was triggered by the flow of migrants. The migrants arrive in Europe in response and as they are encouraged by a more inclusive policy. Originally they came across Hungary but later avoided us. Among the migrants, many try to escape war zones, while others leave their home country hoping for a better life and intending to settle down in an economically more advanced country. None of these reasons is unknown to Hungarians because besides frequent emigration of individuals, Hungarians or people of Hungarian origin live in a large number of countries of the world as a consequence of multiple waves of emigration that occurred during history (either because of wars or for economic reasons).

Owing to expanding co-operation and integration at European level, the concept of European identity emerged in Europe, reflecting the preservation of European values and attachment to the European culture. Globally, the accelerated flow of information and constantly developing communication technology have made the world "smaller" and "more interactive". Real-time information is available for everyone about the options relevant for them from mass communication tools and social media pages. Openness also increases the risks of abuse, as information and options can also be used for malevolent purposes. There has been a rise in the number of terrorist actions across the world, which call for strict measures in order to eliminate the threat. However, that fact cannot be used as an argument when honest people intending to settle down for human reasons are rejected by or expelled from a country.

Internationalization is an objective in the Hungarian higher education. The EU supports student exchange programmes across Europe and the Hungarian state also assists young people intending to study in the Hungarian higher education system with a scholarship designed for foreign citizens (Stipendium Hungaricum). There are more and more multinational companies in Hungary employing a large number of people who live in Hungary but do not speak Hungarian yet wish to integrate to a certain extent. Obviously, such people live in Hungary temporarily, but during the time spent here they discover the Hungarian culture, obtain Hungarian friends, learn the Hungarian language, yet come across posters that contradict to their everyday experience. People coming from different cultures and speaking different languages can work together peacefully, in friendship in small commu-

nities. They respect and like each other and even when it is not the case, it is generally not because of the difference in origin but the human characteristics that also create conflicts between those who speak the same language and come from the same culture.

Globalization has an impact on multilingual Europe at two levels: convergence and divergence can be observed simultaneously. As the English language spreads as a *lingua franca,* it entails international convergence. These days there is no point in the world where one could not use English as the lingua franca. In Europe, the purpose of multilingual education is to teach not only the majority and minority languages but also English as a third language ("glocalization") (Cenoz–Genesee, 1998; Cenoz–Jessner, 2000; House, 2008). At the same time, divergence may be observed at national level – more and more minority languages are being revived (Catalan, Welsh, Basque, Frisian, Romansh, etc.). Bilingualism and multilingualism are increasingly accepted across the world, as people living in bi- or multilingual environments adapt to the circumstances and use both the languages of their states and the languages of their minorities every day.

Convergence and divergence can also be captured in social psychological aspects. Convergence is the historic route of communicative accommodation theory (CAT) (Sachdev–Giles, 2006). Communication partners have an urge to adjust their languages, their paralinguistic and non-verbal tools to one another to create a mutual feeling of solidarity. This phenomenon is especially important in a bilingual situation. Efforts towards social integration and linguistic and cultural definition always induce positive emotions in the receiving party. On the contrary, divergence emphasizes linguistic and cultural differences. Bilingual people use the convergence and divergence strategies in their everyday lives at various social platforms.

In summary, we can conclude that a paradox situation is evolving in the diversity of languages and cultures

- at European level: linguistic diversity is welcomed;
- at national level: linguistic diversity is a threat to national identity and may become an obstacle of integration at the individual level;
- at individual level: it may cause numerous conflicts in a bilingual environment.

In general, identity is examined from two approaches: *demos* and *ethnos* (Smith, 1986). Demos is the public life aspect that reflects the individual's self-definition at the level of the state and society and shows the culture and the language in relation to which the individual can exercise their democratic citizen rights and the conditions that are favourable for them in education and in making progress. Ethnos is self-identification in the private sphere. It expresses the emotional approach of the individual to the language, culture, literature, etc. and their attachment to their home country and relatives. In a monolingual environment, the two spheres usually coincide and therefore self-definition is not a problem for the individual.

In recent times, we have witnessed major changes in the ethnic composition of the population of individual countries (as a result of the enlargement of the European Union or the wave of migrants), and more and more situations develop in which people become bilingual. Specifically because of the reasons outlined above, this bilingualism may also entail self-definition problems, as each individual must weigh the importance of demos and ethnos for themselves. They must decide whether to define themselves with the social or private sphere. This identity also expresses their attachment to culture.

Bilingualism and biculturalism

According to the currently most widely accepted definition of bilingualism, a person is bilingual if they use both languages according to their needs in their everyday lives (Grosjean, 1982). A bilingual person may not be expected to speak both languages at the same level; the holistic approach looks at the individual and their needs. What matters is that the individual is able to communicate with the right people in the right language on the right topics and in the right situations. A bilingual individual is not the sum of two monolinguals but they use the two languages according to their needs. They can discuss certain topics in one and others in the other language.

That complementary principle also applies to cultures associated with languages. Some monolingual people live in two cultures: in general, Jewish communities speak the majority language but follow both the majority and the Jewish culture in terms of their habits and traditions at any point of the world. There are some bilingual communities who nourish the traditions of only one culture. Children born in mixed marriages are good examples, for whom the culture associated with the majority language is dominant. Some children coming from such families are not even aware of the other culture and are not affected by it. It depends on whether the parent not speaking the majority language considers it important to introduce their children to the other culture. There are also bilingual individuals who follow the culture of both languages, though not to the same extent. Consequently, biculturalism is like bilingualism. There is no need to be perfectly aware of the two cultures, it is enough if the individual understands and follows segments of the two cultures that appeal to them.

Many believe that language is the primary factor in defining identity. Others argue that it is the culture and not the language that is the dominant factor in self-definition. This latter approach is closer to our definition because bilingualism is a permanently changing state. For bilingual individuals, the previously dominant language may turn into the weaker language frequently because the conditions change. The same can also apply to culture but identification with a culture depends on the individual's decision, while language rather depends on the circumstances. Culture may be the dominant factor in developing identity. This is why we are aware of Hungarians for whom the dominant language is a foreign language and not Hungarian, yet they declare themselves Hungarians and form Hungarian communities in emigration. Their children attend schools where education is provided in the majority language and, though they establish weekend schools teaching in Hungarian, the main activity or objective remains to preserve their Hungarian culture.

What is the meaning of biculturalism then? We all simultaneously belong to more than one cultures. The main culture includes national, language, social, religious, etc. characteristics, while sub-culture includes occupation, sports, hobbies, etc. (Grosjean, 2008). Main cultures mutually preclude each other, while sub-cultures are complementary and can effectively exist side by side. However, many people take part in the activities of two or more main cultures to a different extent (e.g., the Chinese in the UK, Hungary, etc.). These people adapt to both cultures, sets of values and to both languages in their behaviour depending on whom they are talking to. They mix and combine the characteristics of the two cultures. Consequently, it is often difficult to define their cultural origin and therefore they cannot fully represent any culture at all. The recognition of biculturalism, i.e., bicultural identity, occurs rarely. The recognition of bilingualism with the denial of biculturalism and dual

identity occurs more frequently. The idea that both cultures should be perfectly known is wrong (cf. the maximalist approach to bilingualism: Grosjean, 1989). An individual may become bicultural in a minority area or in a migrant family, where the parents and grandparents feel responsible for passing their home culture on to the second and third generations. The two cultures are important to an individual at different levels, which lead to cultural dominance. Balanced bicultural individuals are as rare as balanced bilingual individuals.

Bilingualism and biculturalism from the monolingual and monocultural view

Europe is still dominated by the monolingual view, according to which, normally an individual belongs to a nation, speaks the language of that nation and is attached to the culture of that nation. This is the inheritance of the nation states. However, as a result of the reasons outlined above, the demographic conditions have changed in Europe and Hungary's accession to the European Union launched some migration of nations not only in Europe but also in Hungary. A number of individuals live and work in Hungary whose first language is not Hungarian and a number of Hungarians live in different countries where they do not use their native language to communicate in their everyday lives and where they do not exercise their citizen rights or intimate relationships in their first (native) language. In such cases the self-definition of individuals may change, what is more, they can even develop a double identity. It is incomprehensible from the monolingual and monocultural views, so in many cases such people are stigmatized.

Another fault of the monolingual view is that just because bilingual individuals live their everyday lives with two languages, monolinguals do not consider them authentic in terms of self-definition. It is a sad fact that Hungarians living in a diaspore in Romania and using both Hungarian and Romanian in their everyday lives are looked down on, and they are not considered Hungarian irrespective whether or not the individuals have a Hungarian identity. Such people are not even considered "true" Hungarians and are many times referred to as Romanians, although in their environment they can only make progress with the Romanian language regardless of the fact that they define themselves as Hungarians at the level of ethnos. The best solution therefore may still be if each individual can decide on their identity and the others respect that decision.

The maximalist view of monolinguals demands from bilingual and multilingual individuals to speak all their languages "perfectly", as "natives". This obsolete view was represented by Bloomfield (1933) and it spread all over Europe and even the world. Notwithstanding the fact that even monolingual individuals are not aware of all varieties of their native language (and they do not require it from themselves), bilingual and multilingual individuals cannot speak their languages perfectly because they do not have a need to do so. According to the functional approach of bilingualism, a bilingual individual uses their languages to suit their individual needs.

The perfect command of a language puts grammatical competence to the foreground, or at least bilinguals can be rather critical about their grammatical performance. They spot grammatical errors immediately, which confirms for them that the bilingual individual is not really bilingual but is rather a "semilingual" and cannot speak "properly" in any language.

The quality of speech production of bilinguals is affected by numerous factors, which monolinguals do not take into account. Bi- and multilingual individuals store two or more languages in their minds, and the languages are in constant interaction with each other. In many cases it helps them in communication, but at other times it may cause disturbance. Between the two extremes, which do not result in any errors, there are interim stages when only some weird expressions or unusual terms may come up, but they are comprehensible to monolingual listeners even though they would never use the same linguistic expression themselves. The two languages are permanently active in the brain but the degree of their activity depends on the linguistic repertoire of the partner in speech, the topic or the situation.

If a bilingual individual talks to a monolingual person, the bilingual will keep their languages under strong control trying to use the language also spoken by the partner in the conversation more actively and to deactivate as much as possible the language not understood or spoken by the partner. The success of these attempts is affected by many factors, including the psychological state and the level of fatigue of the individual. However, when the parties in a conversation share each other's languages, i.e., they both speak the same two languages and are aware that the same situation applies to their partner, this strong language control disappears and both of their languages become equally active. In these cases, there could be code-switching and code-mixing, which is absolutely natural in the communication of bilingual individuals, but is rather strange to monolinguals. When a monolingual individual witnesses such a conversation, they can easily reach the wrong conclusion that the parties having the conversation are rather semilingual than bilingual.

Code-switching, code-mixing

Code-switching is one of the indicators of pragmatic competence. Code-switching, i.e., the alternating use of two languages in a conversation, can be interpreted in a way that there is a good reason why the speaker switches from one language to another. There may be a number of reasons that compel bilingual individuals to do so: the topic, the parties to the conversation, the location, emphasis, quotation, etc. Code-switching is one of the options that bilinguals can use to clarify their thoughts to be communicated.

Furthermore, code-switching is a type of contextualization strategy, a metapragmatic indication (Auer, 1999), which unifies the parties to the conversation specifically due to their bilingualism. Most of the switches takes place on the main syntactic and prosodic borders (at phrasal and sentence levels). The ability of code-switching is not limited to balanced bilingual individuals; on the contrary: bilinguals who have rather limited abilities in one language can also use code-switching. The switch is often preceded by prosodic signs (stress, pause, hesitation) and discourse markers, indicating the pragmatic force.

Code-mixing is a frequent switch of languages within one interaction, as a result of which even the base language of the conversation cannot be determined. Code-mixing requires higher bilingual proficiency (Backus, 1996; Bentahila–Davies, 1995). Owing to the higher proficiency level achieved in the languages while the individual is becoming bilingual, the tendency is always from code-switching to code-mixing and never in the reverse direction. Code-switching may be repeated during an interaction, but it always has

a pragmatic reason. If no pragmatic reason can be detected, the switch loses its pragmatic force and can be referred to as code-mixing rather than code-switching.

Below I present examples that prove lexical code-switching from an interview of an American-Hungarian bilingual individual (1–5). Language is switched at the lexical level without any semantic or pragmatic explanation because the equivalent words and expressions exist in the Hungarian language as well. Presumably the switch is made at the conceptual level because the speaker refers to the American culture and creates an American context for the topic, which triggers the congruent component(s) of the embedded English language:

1. "my mother is a great *designer*";
2. "there was a *winter break*, and a *spring break*";
3. "we were the *ship mop*";
4. "well *reading, English, history, science,* and we also selected *P.E., Spanish, music, arts*";
5. "Naturally, always think of it as *4th of July*".

In the following examples (6–11) the reason for code-switching is the incongruency of the semantic and pragmatic features of the lexical items of the concept in the two languages. In all examples the speaker clarifies what they want to say by switching to the other language. In some of the examples, some hesitation can also be observed before the code-switching (e.g., *well, so, such*, etc.):

6. "art class, i.e., we produced something during the *art class*";
7. "*Community College*, i.e., it is not a large university or college";
8. "my mother took me to such an *egg hunt,* and to similar events";
9. "well, *high school,* because it does not exist there, it is known as *high school* there";
10. "I bought this flour for the *pancake*";
11. "I sent my *résumé, CV,* and I met the *general manager*".

When there is no lexical equivalent of the target notion in the main language of the conversation, code-switching is the simplest solution (examples 12–18).

12. "I think *brownies*";
13. "*Streuselkuchen* – it is a fruity pastry, with fine sweet pastry spread on top, known as *Streusel*, hence the name of the pastry";
14. "they add such a *fudge,* such *chocolate fudge*";
15. "there is a two-year diploma, called *Associate's Degree";*
16. "a good *ranch* with horses is guaranteed only in Canada";
17. "*Kaffezeit* is at four o'clock; *Kaffee und Kuchen*";
18. "there were so-called *Blackpool lights*".

In examples 19–24, there is no more code-switching but rather code-mixing at the lexical level. There is no indication of any difficulty in finding the words in the continuous flow of statements, i.e., nothing interrupts the planning phase. The appearance of the other language cannot even be triggered by a cultural effect.

19. "who was *visiting scholar* from Cambridge";
20. "there was a large *turnover*";

21. “say it is *natural*, but it is not allowed”;
22. “when it happens, I am sent for *lay-off*”;
23. “I am *heterosexual*”;
24. “not so much an *attitude*”.

The switch can also take place on the border of phrases (see examples 25–30):

25. “they know everything *before the court trial*”;
26. “It is very difficult in the US, *‘cause everything is set*”;
27. “He could only feel around because it was a *pitch black inside tunnel*”;
28. “I thought that it was a *once in a lifetime experience*”;
29. “There are some regional, i.e., they are *regions, the Atlantic Division and Pacific Division and Central Division*”;
30. “Um, such, such an ghost story, so a *history of ideas*”.

Such blocks in general refer to a sudden confusion in the speech production planning phase, which may be caused by a number of reasons. Such disfluencies may take the form of silent or filled pauses, restarted statements, repetitions (see Gósy, 2002), and I also include the discourse markers in the same category (see Dér, 2005; 2010). Although Myers-Scotton and Jake (1995) believe that the discourse markets should be considered meaningful words, the discourse markers occurring in my data are words used as fillings, which have already lost their semantic content due to the frequent use. Their usage clearly indicates that the speaker needs some time to form their statements correctly semantically and grammatically. The use of discourse markers often indicates a coming switch between languages, it reveals verbalization or transformational difficulties.

In the Hungarian language the most frequently used discourse markers are *ilyen* (such), *tehát* (so), *szóval* (well) and recently *tudod* (you know). Almost the same discourse markers exist in the English texts as well: *so, like, you know*. Speech disfluencies and discourse markers often occur concurrently.

In examples 39-46, code-switching is preceded by a Hungarian discourse marker in the Hungarian context. In all cases, the persons making the statements cannot find the proper words because they cannot find the right congruent concept (e.g., *interior decorator*) or because in the Hungarian lexicon the matching word or expression does not exist *(chocolate fudge, Easter-basket, college)*, or because they do not feel that the Hungarian equivalent of the used word is congruent enough *(British, shy)*.

39. “his wife is like *an interior decorator*, I cannot say better”;
40. “I think it was such *a British thing*”;
41. “there is such *an Easter-basket*”;
42. “such *chocolate fudge*”;
43. “so quiet, so *shy*, reserved”;
44. “polyes…, not polyester, but cotton, *cotton*, so *kind*, and so *warm*”;
45. “there were the so-called *gangs*”;
46. “three is a so-called *college*, dormitory within the University of London”.

Self-assessment of bilinguals

The majority of bi- and multilinguals have a positive attitude towards their ability to communicate in multiple languages and to be able to use their languages in their everyday lives. Many emphasize the various advantages of that ability. Grosjean (1982: 271.) has collected a few examples: *"I can speak Burmese to my friends if I don't want people around me to understand what we are talking about." Or: "It extends your horizon. It means that you live in two worlds and not in just one (friends, cultural aspects, job opportunities, etc.)."*

Some consider it an advantage because wherever they go there are no language barriers, they can communicate with people coming from different cultures, can experience other cultures, read literature in the original and become tolerant and open. A German-French-English trilingual individual says the following: *"My triilingualism helped me a great deal. In my job the languages helped me get promotion, my language skills have developed a great deal, I am more open to minorities and I understand their language problems well. The fact that I am trilingual helped me understand others and help them."*

Others are disturbed by the difference between the proficiency levels of their languages; they look at themselves with the maximalist view and demand identical and perfect knowledge of the two languages from themselves. As it is not possible due to their natural environment, many do not declare themselves bilingual. They are embarrassed about their code-switches and code-mixes, which are absolutely natural phenomena in the communication of bilingual and multilingual individuals.

Generally they do not like interpreting or translating because it is not what makes them bilingual. They are bilingual because of their capability of the alternating use of their languages in their everyday lives according to their needs. At the same time, monolingual people expect intermediary skills from them, but not all bilingual individuals can comply with that expectation. Bilinguals learn their two languages to suit their needs, while translators and interpreters are trained for specific tasks.

Among the expressions of both positive and negative feelings, we find examples related to biculturalism as well.

Many feel that they behave differently when they use their two languages, but it is due rather to the context, the style and their adaptation to their partner in conversation, i.e., to CAT (communicative accommodation theory) than to the languages. Sachdev and Giles (2006) explain that the convergence recently observed in Europe is historically based on the theory that communication partners try to adapt to each other with linguistic, paralinguistic and non-verbal signs as well to make their partner feel their solidarity (e.g. by communicating more softly with a Russian, in a more business-like manner with an English person; an Arabic-French bilingual male communicates with Arabic women authoritatively and talks to French ladies in an easy manner). This type of conduct is extremely important in bilingual situations.

In a TAT *(thematic apperception test)* (Ervin, 1964), in which a story must be created from a picture, an English-French bilingual made two different stories based on the picture: in the French version, the woman believes that her husband is cheating on her and pleads with him not to leave. In the English version, the husband is preparing for a job interview, and the wife encourages him trying to convince him that their life will be much better if he succeeds.

In a different test, the participants had to complete sentences (Ervin–Tripp, 1968). Let us take a look at the answers of a Japanese-English bilingual individual in the two languages.

- *If my dreams do not match those of the family…* (Japanese: *I will be sad;* English: *I will do what I want).*
- *Probably I will be…* (Japanese: *a housewife,* English: *a teacher)*.
- *True friends must…* (Japanese: *help each other*, English: *be honest with each other*.)

The above example may prove the wrong assumption for a layman that bilinguals have a split personality or are schizophrenic. According to Adler (1977), everything that is expressed by language (history, culture, geography) exists twice in a bilingual individual. A child becomes schizophrenic if they can explain their emotions in two ways. Adler refers to an English-Afrikaans bilingual individual who is mad in one language and normal in the other. Adler has another deterring example of a bilingual individual who has hallucinations in one language but none in the other.

Haugen (1961) and Grosjean (1982) explain that the different mental states could be caused not by the bilinguality of the person but rather by the person's status in the society or their personal features. Monolingual individuals may be schizophrenic just as bilinguals. So the above example does not prove anything apart from the fact that different cultures belong to different languages and that bilinguals express the attitude accepted and generally used in a particular culture in the used language. This also reflects the impact of CAT (communicative accommodation theory).

Myths about the advantages and disadvantages of bilingualism

Although many admired the people speaking two or more languages, bilingualism was not always thought to be something positive. At the beginning of the 20th century, it was considered harmful and people believed that infant bilingualism impeded the cognitive development of the child because it imposed such a cognitive and mental burden on the individual that the natural language development slowed down and resulted in a lower IQ level. They used methodologically wrong tests to prove that bilingualism had to be avoided, as it may also cause personality disorders. To prove the harmful effect, they used tests developed for English monolingual middle class children to examine the English language competence of Welsh-English bilingual working class children. Naturally, the results of the bilingual children were much weaker than those of the monolingual children. This method was not fair because it predicted the researchers intention: to put bilinguals into a disadvantaged situation.

It is not accidental that many bilingualism researchers led by Grosjean are against using tests designed by monolinguals to examine bilingual children (Grosjean–Li, 2013; Grosjean, 1998). Using an analogue example taken by Grosjean from sports: the performance of a high-hurdler cannot be compared to the performance of a short-distance runner or a high jumper. The latter two practice only one skill, respectively, at an extremely high level, while a high-hurdler combines two skills while doing a branch of sports of specific configuration. Similarly: a bilingual individual has a very special language configuration, combining the elements of both languages at a level at which they need them. In Hungary, e.g., the pre-school tests prior to school administered by speech therapists were also designed

for monolingual children and all bilingual children are also tested with these very tools. There is clearly a need for a measuring tool designed for bilinguals in order to prevent any distortion in the assessment of bilingual children starting school.

In the 20th century, researchers reached the point of emphasising the advantages of bilingualism, also based on tests conducted with doubtful methods. At that time the tests were carried out on selected children of intellectual parents, who were attending elite schools. Those tests revealed that bilingualism was not disadvantageous but, on the contrary, clearly advantageous because learning two languages does not represent such a cognitive burden that children would not cope with it; in fact, it enhances metalinguistic awareness, improves the abstracting ability, enhances tolerance and the acceptance of difference.

At the beginning of the 21st century, Bialystok conducted a number of research projects (2001; 2004 and 2007) and, with her co-author, a meta-analysis (Bialystok–Barac, 2013), arguing that the positive effects of bilingualism can be felt not only in childhood but also at an older age. Bilingual individuals are less prone to dementia (as also confirmed by Freedman et al., 2014) and Alzheimer disease (Bialystok et al., 2007). Children learning multiple languages at an early age develop various strategies that stimulate brain activity, and it has an impact not only on acquiring a new language but also on any other learning and brain activity (Marian–Shook, 2012). According to a different research (Adesope et al., 2010), bilinguals are better than monolinguals in metalinguistic and metacognitive awareness.

There are also neurophysiological research projects focusing on bilingualism. One of the most surprising results is that the grey matter density is much greater in bilingual than in monolingual individuals (Mechelli et al., 2004), and there is also a positive correlation between grey matter density and language proficiency level, while there is a negative correlation between grey matter density and age of second language acquisition. This means that irrespective of the age when an individual starts learning a second language, it has a positive effect on the brain, yet it is best to start it before the age of five. Grey matter is responsible for any kind of learning process and therefore those who learn languages will not only be able to learn a new language more easily, but they will also learn anything else with less effort.

There are also some critical voices about this great optimism. De Bot (2015) suggests that the reason why bilingualism seems so advantageous is that international journals tend to publish articles in which authors present positive results, and the studies that do not confirm the advantages of bilingualism because the researchers could not come up with any result in that regard are not published at all or only in a very small number. The reference index is also significantly greater for articles that present successful research projects. In the end, De Bot also comes to the conclusion that bilingualism is clearly advantageous both socially and psychologically, at the same time, other factors that grant special abilities to bilingual individuals in combination with their bilingual competence (e.g., encouraging environment, music, high-level education, etc.) still require further examination.

Bilingualism and biculturalism in minorities and among immigrants

There are a number of ways in which an individual can become bilingual – some of those guarantee the learning of two cultures, yet others do not facilitate cultural immersion at all or only with difficulty.

Linguistic minorities

In a supportive environment, bilingualism is obvious for a family living in a linguistic minority because they try to preserve their minority language at the ethnos level, yet they must also speak the majority language at the demos level if they wish to perform well in the society. For linguistic minorities the minority culture is also extremely important but they cannot separate themselves from the major culture either as they are part of it. Each individual living in a minority must decide for themselves which language and which culture will be dominant for them. However, in general, people living in linguistic minorities tend to declare that they belong to the minority culture even though the majority language is dominant for them. Such families speak the minority language at home and the majority language in the society. For children growing in such families the language input will be mixed because the minority language used by the parents at home contains a lot of majority language elements and they build friendship in the street, on the playground and in children's institutions with others speaking the majority language, thus they learn both languages and often switch codes just like their parents.

For linguistic minorities it may be difficult to preserve their minority language if it has no prestige in the society and the state does not support them. International linguistic rights documents (including the *Hague Recommendations*) demand from the states that they grant the fundamental human rights to linguistic minorities living in their territory to use their own language and, what is especially important, to provide them the right to start school education in their first, minority language. If this right is granted, it is easier to preserve the minority language. However, there are also examples that despite the fact that education in their native language is available, parents decide to enrol their children in a majority language school either because they expect higher-quality education or they hope for better opportunities to make progress there. In that case, the majority language becomes dominant, but the individual's identity may still be attached to the minority culture. A process of losing the language may start but it does not shake the identity of the individual.

Minorities are in a more difficult situation when they do not receive support from the majority society and when there are no institutions offering education in the minority language, especially when the minority language (and group) is stigmatized in the society. If that happens, the process of losing the language is more intensive and the linguistic assimilation of minorities occurs sooner. Under such circumstances, cultural assimilation also occurs sooner and the individual's identity may change.

Bilingualism of immigrant people

For families who arrive in a new country with the intention of settling down, the motivation to learn the majority language is very strong. Emigration may be driven by a number of reasons, including political and economic ones, which will not be discussed in this paper. Regardless the cause of emigration, those who decide to continue their lives in a different country and in a different culture often risk their own lives before they achieve their goals. They hope for a better life and do not wish to lose their identity.

Their bilingualism is composed of the use of two languages in their everyday life: their first language at home, among the family and the majority language in the society. It is a frequent pattern observed in such families that the language shift takes place within three generations. The immigrants arrive in the target country mostly as monolinguals, where they learn the language of their environment. Their children use the first language of the parents at an early age, but as soon as they start attending an institution (kindergarten or school), they tend to use the language of their immediate environment more frequently and the less time they spend at home, the stronger the second language becomes, and by the time they reach adulthood, the majority language will be dominant for them. Consequently, the second generation is bilingual and in general it depends on the language of the spouse whether the third generation will be majority language dominant bilingual or monolingual speaking only the language of the immediate environment.

The first generation usually tries to preserve its first language and also tries to encourage their children to speak it. Below there are a few quotations from the memories of children of immigrant parents (collected by the author, presented fully matching the text).

"The truth is that I was able to develop my Hungarian only here. At home I spoke Hungarian only to my parents and mostly to adults, and as I spent my time with adults rarely, and with friends much more often, we tended to speak English and very little in Hungarian. I still learnt it because my father talked to me a lot, for which I respect him greatly. He often made us read books in Hungarian and we had to write a diary for him in Hungarian, where he always checked and corrected the grammatical errors." (English-Hungarian bilingual individual living in Hungary at the time of the interview.)

The excerpts from an interview below also confirm that the parents try to preserve the first language, but for the members of the second generation it is more natural to speak the majority language among themselves. Parents wish to pass on not only the language but also the culture to the second generation.

"A: So our parents were Hungarians, but we were born in this country. The mothers met and exchanged gossip, while we danced or, when it happened at school, entertained ourselves.

Q: Well, you must have had a rather good community life.

A: Yes, um. However, we spoke more English to each other, so it is good that the program was in Hungarian, but...

Q: Was it easier?

A: Yes, of course.

Q: And the masses you attended were also in Hungarian?

A: Of course, yes, yes.

K: What about the family, your brother, did you speak in Hungarian to each other?

A: No, well, um. What? No, English. Well, the situation was and is that my parents spoke to us and to each other in Hungarian and he, i.e., my brother and I, spoke English between ourselves and also to our parents. My mother would ask in Hungarian: »Where are you, Zsuzsika?« and I replied in English, »I'm upstairs.« Well, this was it…

Q: So this was it. So your mother asked a question in Hungarian and you responded in English?

A: Yes.

Q: And did you deliberately do that after a while, or this is what you got used to?
A: No, it was so nat… simpler that way. What was deliberate was the instruction from our parents to speak in Hungarian, to which we responded.
Q: So you switched to Hungarian.
A: Yes, but it was instructed, i.e., it was a forced situation.
Q: And have you always spoken to your brother in English ever since you were small children?
A: I cannot speak to my brother in Hungarian. So the situation that now we should sit down because there are Hungarians here and we must speak Hungarian is very strange.
Q: And what about family events, birthdays and Christmases? What did you do then? How did you celebrate?
A: What do you mean?
Q: Which traditions and customs did you keep? The Hungarian or the Canadian ones?
A: No, the Hungarian ones. Yes, it was not Santa Claus who came to us but Jesus, Little Jesus visited us at Christmas. Yes, we kept the Hungarian, the Hungarian customs.
Q: And you had Father Christmas on the 6th of December?
A: Yes.
Q: Or Santa Claus?
A: Yes, yes.
Q: And at Christmas, you were visited by Little Jesus; and at other times? I don't know what traditions are there in Canada. Did you celebrate any of the Canadian holidays?
A: Well, there is Thanksgiving, which is a holiday, so you don't have to work, or you don't need to go to school, and of course we adopted it and we had turkey then. And so on, well, yes, after all, yes. Yes, we also adopted them.
Q: And others, like Halloween and similar?
A: Well, yes, Halloween as well. In the end it is not a family celebration at all.
Q: No, it is for children.
A: Of course, what is different at school..., at school we spoke English, and therefore adopted the customs.
Q: Well, yes, that culture.
A: Well, yes, people adopt it or I don't know how it is.
Q: What about birthdays and namedays?
A: There were no namedays, they were left out, but there are birthdays there, with a birthday party and...
Q: Cake and other things?
A: Yeah.
Q: The same? And do you celebrate Christmas in the same way, in the evening of the 24th?
A: Yes, so we follow the Hungarian customs, but how exactly? I am tired. I don't remember. Oh, yes, Christmas Eve, the 24th, yes, so it is not...
Q: You have a Christmas tree which you decorate?
A: Yes, yes.

Q: And what language do you speak in the meantime? And what songs did you sing during those celebrations?
A: We used the Hungarian language; we know these songs only in Hungarian, but OK, some of them also in English, as you learn a few at school.
Q: But not at home?
A: No, no, not at home. My parents, they do not know these songs in English.
Q: Do they not even want to? Did they not adopt these things?
A: No, but what for?"

An Urdu-English bilingual individual of Pakistani origin, who grew up in England, remembers his childhood as follows: *"It was what every conversation amongst adults seemed to eventually settle on: how to try and protect the children from temptations and reinforce their Pakistani identity."* (Manzoor, 2007).

It is not easy for the second generation to maintain the first language and culture. Temptation is great, the second language is more attractive, because everyone speaks it in the society and the parents also use it. So it is simpler, more economic and more rewarding for the new generation to use it for communication. They have different objectives and wish to integrate sooner and better, for which the language (and culture) of the society is indispensable.

"My parents had assumed that once I graduated I would return to Luton with a degree and a job, but despite my lack of career and cash I was still not willing to come home. In Manchester I was free; I could stay out late, play music as loud as I wished, wear black leather trousers and red velvet shirts and shake my dreadlocks to Lenny Kravitz. Once a month I would make the three-and-a-half-hour train journey back to Luton to see the family but only out of a sense of obligation. ... When I walked through the front door of my parents' home in my blue corduroy jacket with a 'Born to Run' enamel badge pinned on its lapel and my rucksack on my back, my headphones still plugged in my ears, I could sense my father's confusion. I knew he was thinking, 'What are you doing with yourself?' and the worst part about it was that I could never explain it to him. When I rang my father to tell him I had secured my first writing commission he was silent for a few seconds. 'How much will they pay you?' he finally asked in Urdu. I never spoke in English to my parents." (Manzoor, 2007: 2.)

In many cases their identity is the result of rebellion against the parents' generation: children do not want to keep the old habits, they wish to integrate into the majority society, obtain friends and open to the world.

"I defined myself in opposition to my father. All that he believed, the values, the ambitions he cherished I rejected as embarrassing and outdated. When he said he was Pakistani, I declared I was British; he was Muslim, I was confused..." (Manzoor, 2007: 6.).

Young people intending to integrate are often ashamed of being different, which in general also marks the start of the process of losing the language and, in many cases, also the identity. The following excerpt was presented by a person of Hungarian parents, born in the United States. They spoke Hungarian at home until the child started attending school. When friends visited them at home, the child asked the parents not to speak in Hungarian in front of the American friends so that they do not notice that they were different from other Americans. The younger brother can hardly speak Hungarian because the two siblings

always spoke in English between themselves even at home. Nonetheless, the parents tried to do everything to pass on both the language and the culture. That is how the interviewee remembers a story from his teen ages:

"...my parents once wanted us to attend a Hungarian school. We went, and on the first day my younger brother and I went into a room where we found Hungarians who were dancing in um, old clothes, Hungarian clothes, you know, very old, and such a Hungarian dance, and my younger brother and I both decided that it would not happen. No – I said to my father and mother, you think that I would attend that school? [...] *I seriously told them that I would not go to that school even for a minute. So, let's go back to my other old school and we should leave the Hungarian school alone, you know. Such Hungarians, who dance, I do not wish to know anything about them, you know?"* (an American-Hungarian bilingual)

As soon as the rebellion age is over, the descendants also see their parents, the culture and language of their parents differently and they show some remorse. *"When I was younger I didn't want to know who my father was because I believed my father had nothing to do with me. How wrong can a son be?"* (Manzoor, 2007: 6). Curiosity arises and they wish to learn and understand the language and culture of their parents. The young American-Hungarian bilingual man quoted above moved to Hungary at the age of 26 and actively uses both languages at an American company, where he works. A young man born in England moved to Hungary at the age of 23.

"Well, the truth is that I felt very different. The fact that the school was very international and, as I said, there were many Polish, Pakistani and American students. So the class was very mixed but I never considered myself truly British. I knew that I had a different name and I spoke a strange language that nobody else understood at the school. As we spoke Hungarian with my parents at home and ate Hungarian dishes, well, I felt Hungarian but did I think about what Hungary was like?" (a Hungarian-English bilingual)

However, the previous definite Hungarian identity was shaken after moving to Hungary due to the Hungarian monolingual society. Thinking about identity, this young man explained that the behaviour of the society towards him made him uncertain about his identity. To the question whether he considered himself English or Hungarian, he responded as follows:

"Neither Hungarian, nor English, and this is what makes it difficult. I feel good in England, I have no problem with any practical issue and I can express myself there. I speak the language well, as I lived in England for more than twenty years […] *but there is still something that makes me feel different. I have never had a huge desire to be British, to be fully British and to become English. So this is one aspect. The other is that I am now in Hungary, with a Hungarian passport and Hungarian salary, but it is still impossible for me to behave without being noticed or known by someone that it is not the case. It is obvious that I am not an average Hungarian with 100% Hungarian attitude or identity or behaviour."* (a Hungarian-English bilingual).

The ethnos and demos level definitions confronting in an individual are illustrated well in this story. English helps much more this individual in practical issues because he has lived the majority of his life in England so far and he understands more about the progress of things, resolving problems and managing matters. However, the emotional links and intimate sphere connects him to the Hungarian language and culture because that was his family language and that is what he used with people who were closest to him. Having switched homes, he understands that the language he used in a small community does not

allow him to become a member of the society to the same extent as to those who have always been living under such circumstances and speaking this language at every level. That is why he cannot feel comfortable. Maybe it is one of the reasons why a number of bilingual individuals do not even care about the issue of identity and declare themselves European or cosmopolitan instead.

Factors affecting identity

Language

The international linguistic rights documents do not recognize the importance of the use of the native language without a good reason. If an ethnic group in minority cannot exercise their linguistic rights and are constantly affected by the impacts of the majority language, the first language will soon deteriorate and the process will end in the loss of the language. If the first language signs disappear in the streets and public areas, individuals will more and more frequently use the majority language definitions: this is where the process of language shift starts. This is why it is important to fight for maintaining bilingual signs in bilingual areas.

The Hungarian language is the primary component of identity for Hungarians living across the borderline of Hungary. Although the linguistic rights of minorities are expressed to a certain degree in the language acts of the countries, in reality there is still much to be done in that field. Looking at the linguistic landscapes of Transcarpathia, Upper Hungary, Voivodina and Transylvania, it is obvious that even if bilingual signs exist in many areas, they usually show the disadvantaged situation of Hungarians (Híres-László–Márku 2015). Csernicskó and Fedinec (2015: 234.) refer to Brubakerre and colleagues (2011: 261.), and contemplate that *"the nation holds the statehood, they are at home and everyone else is only a guest. There is only one step from this view to the theory according to which in a state, only the language of the dominant group can be the only official language of the state. This is how language transforms from the tool of communication and identity into a political and national symbol."*

Many believe that language is of primary importance in preserving identity. When the possibilities to use a language reduce, the level of skills of those speaking that language will also be reduced, which leads to the direct consequence that people reduced personalities when they have to express themselves in the particular language. That is why they choose to use the other language and the end of the long process is language loss and often an identity loss as well.

Within families, individuals often become bilingual because the native language of their spouse is different. Depending on the frequency of language use, the native language of one party will also be pushed into the background in this situation and, again, the process of language loss begins. The particular party may experience it as a bad thing, because the confidence given by the language begins to disappear and they also feel that they are losing their identity. The book *Bilingual Couples Talk* (Piller, 2002) proves how hot this issue is. In the book, marital partners are encouraged for convergence with advice that they

should concentrate on similarities, emphasize cultural closeness rather than distance, push their national identities into the background and put the stress on their common identity.

A Finnish-German bilingual individual had the following response to the question whether there is any correlation between language and identity: *"Language and identity? The two are very closely related. I am a different person when I speak Finnish, German and English."* A German-Hungarian bilingual individual expresses similar things. *"When I speak German, I feel I am myself, when I speak Hungarian, I feel different. It is like putting on a coat, which does not feel natural. It is alien."*

The reduced language skills sooner or later lead sensitive bilingual individuals to a conclusion that they have a reduced personality. Here are a few examples:

- *"When I speak Finnish, I can be rather entertaining and sarcastic. I can't do the same in German."*
- *"I am especially bad at ironic texts, but occasionally even direct speech is adversely affected by my language problems."*
- *"I feel that I cannot be as accurate as I want to be."*
- *"I must admit that I have a minority complex when I speak German. I am less certain and I take everything as an insult. I never feel zero or an idiot because of my Finnish boss, but I ALWAYS feel that because of my German one."* (Emphasized by the interviewee.)
- *"I have a grey personality when I speak my other language. At least at the emotional level I feel a completely different person. I am not a full person when I speak my second language. Even my tone is different (the Finnish is deeper and more convincing)."*
- *"...I felt like a deaf and dumb."*
- *"...It feels like being in a glass bubble. Around me people were moving their lips and I understood nothing."*

The recognition of language attrition further deteriorates the chances of double identity.

"There was a time when I constantly switched codes. As years went by in my bilingual home, this problem was resolved and these days I switch only rarely. I feel that my native language is losing colour and I constantly admire the language of monolingual Finns, the large amount of idioms which have already been lost from my language repertoire." (Finnish-German bilingual)

"Your native language competence will suffer if you spend a few years outside your home country. Your knowledge about culture and society will diminish, you will not understand the new idioms and there will be words that you do not know. Naturally, you cannot develop your language skills because you do not have an opportunity to do so." (Finnish-German bilingual)

Culture

Bilingualism and biculturalism do not always go together and in most cases culture determines identity. The Armenians in Hungary have assimilated and use the Hungarian language but have preserved their culture next to the Hungarian culture and declare them-

selves as people with a double identity. In the UK and the United States, the same language is spoken (although in different varieties) but the people live in totally different cultures and therefore declare themselves English or American. In Kenya, the majority of people are at least trilingual: they speak Swahili, English and a tribal language but they have one culture. In general, the Jews have preserved their original culture wherever they live but in many cases they have remained monolingual and speak the language of the society, yet with a double identity.

Politics has a great role in whether people belonging to a minority group in the territory of a state declare their self-definition or not. Hungary has always been a multinational country but the 20th century brought major changes in the situation of nationalities. The census results reveal the following data about the officially recognized 13 minorities (Table 1) living in the territory of Hungary.

Table 1

Size of the 13 national minorities in Hungary based on their declared nationalities and native languages

	Number of individuals belonging to national minorities				**Number of individuals recognising the minority language as their native language**			
	1980	**1990**	**2001**	**2011**	**1980**	**1990**	**2001**	**2011**
Bulgarian	–	–	1.358	3.556	–	1.370	1.299	2.899
Roma	6.404	142.683	190.046	308.957	27.915	48.072	48.685	54.339
Greek	–	–	2.509	3.916	–	1.640	1.921	1.872
Croatian	13.895	13.570	15.620	23.561	20.484	17.577	14.345	13.716
Polish	–	–	2.962	5.730	–	3.788	2.580	3.049
German	11.310	30.824	62.233	131.951	31.231	37.511	33.792	38.248
Armenian	–	–	620	3.293	–	37	294	444
Romanian	8.874	10.740	7.995	26.345	10.141	8.730	8.482	13.886
Ruthyn	–	–	1.098	3.323	–	–	1.113	999
Serbian	2.805	2.905	3.816	7.210	3.426	2.953	3.388	3.708
Slovak	9.101	10.459	17.693	29.647	16.054	12.745	11.817	9.888
Slovenian	1.731	1.930	3.040	2.385	3.142	2.627	3.187	1.723
Ukrainian	–	–	5.070	5.633	–	674	4.885	3.384
total	54.120	213.111	314.060	555.507	112.393	137.724	135.788	148.155

Source: KSH (HCSO)

The data reveal that there are almost four times as many people who have a minority self-definition (555,507) than those who declare a minority language as their native language (148,155). It suggests that they are assimilating in language but the cultural values are important for them and therefore most of them are monolingual but bicultural. I have emphasized three minorities whose data reflected spectacular changes between 1980 and 2011. In 1980, in total 6,404 individuals declared themselves as Roma compared to 308,957 in 2011. As a

result of the supportive minority policy of the governments, there was an even and positive increase in the declaration of nationality. Although the number of those declaring one of the versions of the Romany language as their first language also grew, that increase was much lower than the declarations on national identity. A similar change can be observed in relation to the German minority as well. There is a more than tenfold increase in their identity, while the number of people speaking German as the first language has practically not changed. For the Slovaks, the number of nationality declarations has trebled, but the number of those who use Slovak as their native language has reduced significantly.

It is a question how reliable the census data are because while in 2001, 570,537 individuals did not wish to declare their nationalities, this figure reached 1,455,883 in 2011. The same applies to those who declared a minority language as a first language. In 2001, in total 541,108 people did not make such a declaration followed by 1,443,540 in 2011. Between 2001 and 2011, the ratio of those declaring themselves Hungarian fell from 92% to 84%. The underlying reasons require further research but it may be assumed that this fact has something to do with the increased number of those who do not declare their national identity. Another possible hypothesis is that European identity gradually overrides the national identity. One more assumption is that for bilingual and multilingual individuals identity is a difficult notion because they are part of multiple cultures and they do not even deal with the issue of self-definition.

Conclusions

It follows from the above that the self-definition of an individual is influenced much more by the culture than by the language. The decision of a bilingual individual on their own identity depends on relatives, culture, language, physical appearance, education, social acceptance, etc. A bilingual individual can belong either to one or to another culture, to both or to neither. In an ideal situation, they should naturally belong to both, otherwise they can easily fall victim of exclusion.

Inclusive policy makes life easier for both the majority and the minority because it emphasizes common human values rather than focusing on differences. Linguistic and cultural diversity is beneficial for everyone. At the same time, excluding policy creates tension and aggression, which no one needs. The statement of the above quoted Urdu-English bilingual individual, who grew up in England, is thought-provoking:

"If I could have summoned a genie who could have rubbed my brownness off... as it was impossible, I settled on being invisible. That was how I felt being Pakistani during the eighties: I wanted to be invisible and anonymous so that no one could point at me and say: 'You are different and you don't belong.' This country doesn't seem to accept me as one of its own, and yet where else did I have that I could call home?" (Manzoor, 2007: 255.)

Bilingualism is becoming more and more accepted all over the world. According to a recent survey, in Australia, for example, the number of English monolingual students is falling at universities, and the prestige of bilinguals (immigrants) is growing. In Germany, German-English, German-French or German-Spanish (elite) bilingualism is considered a positive phenomenon. However, Turkish-German, Greek-German, etc. bilingualism is a stigma. Similarly, Slovak-Hungarian, Serb-Hungarian bilingualism is stigmatized; in some

extreme cases it triggers aggression in the majority state. In this latter example, the reason for the stigma is biculturalism and not bilingualism. These phenomena prove the inflexibility and discriminative attitude of the host states. Unfortunately, negative events further contribute to the loss of identity of individuals forced to become members of minorities through no fault of their own. Politicians should consider this and the individual states should revise their language and minority policy accordingly.

Double identity cannot be condemned – all it means that an individual is simultaneously part of two cultures, they can perform in different situations and do not consider either culture superior to the other.

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Zoltán Lehel Lakner

The Social Face of Security

"Without security, there is no freedom!"
(Humboldt)

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Abstract

The right for social security is guaranteed by the Constitution of Hungary. This gives the state the power to – depending on the economic performance – help strengthen the welfare of its citizens.

While addressing the issue of social security the author looks back at the time of political changes. At that time the key issues were the establishment of external freedom and the creation of the conditions for the new political and economic order of a social market economy.

Social crises and extreme poverty management had to be solved first. The Social Crisis Management Programs Office was established for that purpose. Then the region's first social law was born. The system of care for homeless people was formed. Many social innovations were implemented. Good examples are the social land program and the village caretaker service *(falugondnoki szolgálatok).* These are now mentioned among the best European practices.

Today, 25 years after the political changes, Hungary is among the countries with the least inequality in Europe; poverty shows a steadily improving trend, better than the European average. It remains a fundamental objective to improve welfare conditions, stability and strengthening the social face of security.

Keywords: social security, social rights, inequalities, change of regime social politics, social market economy, poverty, convergence

Se cura socialis

Our concept of security is determined by the social well-being of the individual. The uncertainty of everyday living, in connection with economic and financial uncertainty, is not

only a social issue that relates to our standard of life, affecting large social groups and also a personal social issue, but is also a factor indicating the operation, responsibility-taking and leadership abilities and solidarity of the state and of the governments with which the actors of public life can be kept under political pressure and is therefore an important determinant in public life stability which, in certain historic moments, can clearly weaken the external and internal security of a country.

The Latin origin of the concept of security points to life without any fear or concern. It refers to a situation where we can hope to avoid bad things, and that satisfying at least our fundamental social needs will not be at risk. The degree of fundamental social needs, i.e., sufficient quantity and quality food, housing, access to useful knowledge components in society etc. and the subjects the social security of which is the responsibility of the community and the state in terms of support and provision are also the subject of ongoing debate. Naturally, the degree of access to goods may also be interpreted within the context of individual responsibility, but the responsibility that can be attributed to the actors of complicated social relations and the initial inequality situations definitely raise the issues of equity and justice to a variable extent. However, if we also consider how much the social and social policy decisions adopted in certain historical moments and the income generating and income distribution mechanisms can determine the opportunities in life of not only individuals but of entire social groups, we can see that *the social face of security can really be interpreted in the context of public liability and common good.*

If we look back on the recent past, we must see that all European civic development, i.e. modernization processes, have shaped the life of societies and their members through widening and reinterpreting the concept of freedom. As civil society is growing, political and human rights appear and gain strength, including the freedom of religion, speech, gathering and thought through the freedom of choice and eligibility, free initiatives and enterprise to the economic, cultural etc. freedoms and the actual and exercisable rights thereof. The *social rights,* the contents, degree and the mere existence of which is extremely vulnerable and disputed, appeared in fact only in the last decades of the 20th century. That naturally also relates to the constant reinterpretation of the role of the state. We have reached a point that social rights have become part of a number of national, including the Hungarian, constitution.

Consequently, the right to social security is a guarantee component of the Constitution of Hungary. The disputes about its interpretation focus on the degree of social services, i.e., on the one hand, the size of support with which, when granted, the standard and quality as well as opportunities of life of the citizens concerned may become socially acceptable and, on the other, the quality of the commitment of the state according to which the state may only assume legal guarantees for the welfare of its citizens or it undertakes the obligation to create social security "only" as an objective of the state.

Pursuant to Article XIX (1) of the Fundamental Law, Hungary shall strive to provide social security to all of its citizens and provide services pursuant to the law. Obviously, in view of the cyclically appearing impacts of the crisis, the legislator relies on the empirical, everyday and practical, fact that social rights require a strong and long-term, predictable economic background and therefore the legislator cannot undertake to list the social rights one after the other, taxatively, resulting in subjective rights because an economic crisis may impede the enforceability of the social rights. At the same time, the definition of the

establishment and protection of social security as an objective of the state simultaneously imposes moral, legal and practical tasks to the state that has primary responsibility for creating the common good.

The definition as an objective of the state provides an opportunity for extending the concept of common good and of those taking responsibility for it and therefore democratic legal principles (may be) are enforced as the state implicitly shares the responsibility for common good between the individuals and their communities or extends that responsibility to them. Naturally, it is not only a right but is also a moral option and obligation of the citizens without being regulated in detail by the Fundamental Law.

To get back to the main question, the point is, in essence, that the new Fundamental Law grants the right to social security through the system of social institutions and measures, i.e. through the social and social security services. It may also be interpreted as a significant change in approach that the group of risks included in the list has also grown and now it also contains the protection of motherhood. Old-age benefits continue to be protected by the Constitution, although in an altered form of editing: "Hungary shall contribute to ensuring the livelihood for the elderly by maintaining a general state pension system based on social solidarity and by allowing for the operation of voluntarily established social institutions." (Article XIX)

Article II of the Fundamental law, according to which, "Human dignity shall be inviolable" also needs to be emphasized. In that context, it is also worth pointing out that the Fundamental Law has further extended the objectives of the state relating to social rights. Pursuant to Article XXII (1) "Hungary shall strive to ensure decent housing conditions and access to public services for everyone." As we live our everyday lives in the network of various social and public service institutions, one of the basic conditions of the security of a citizen's life is also defined there. However, the clause on dignity refers not only to protection against humiliation, but it goes beyond that and refers also to satisfying living, housing, health, etc. needs, thus strengthening the needs for social security. It is true that it "only" means commitment to relative security, at the same time it also indicates that in the life of a national community the principle of individual responsibility must also be maintained specifically because of dignity and the inseparable duality of freedom and responsibility.

The Taste of Freedom – Growing Inequalities

In order to understand the processes and our present social reality, we should go back to the beginning. Obviously, the regime change occurred with the highest speed in the establishment of external freedom and the sensitive and volatile implementation of the system of political institutions and economic policy freedom, we were soon disappointed by the development of the extremely wanted welfare conditions.

The social policy and the demand and supply side of social services all went through regime change processes but due to the loss of the social balancing (in fact, reducing) structures that functioned at a low level, yet stably during the years of socialism, the overwhelming majority of the population experienced uncertainty, damage and loss *and the loss of security as their fundamental social experience.* Naturally, such processes also led to political distrust and instability; *the taste of freedom became bitter in our mouths.* What the

population previously dreaming about the Western quality of life could not expect at all was the immediate and incredible amount of new types of social challenges, such as the unexpected rise of high unemployment, the mass appearance of extreme poverty, the depressive patterns of homelessness and, naturally, the rising inflation perceived as an infinite process.

It only added to the bad atmosphere that, simultaneously with the restructuring and market transformation as well as economic decline involving the loss of markets, the revenues available for the state dropped radically when the needs of the population also increased radically, at least to the same extent. The household expectations towards the state continued to function and increase according to a kind of "socialist habit" without the continuation, at least at the beginning, of the ability of the state to satisfy such needs. The fact that the society was able to avoid drifting apart even despite the permanently emphasized predictions was, so to speak, an economic miracle, although the relatively fast development of new social policy of the changing regime also played a major role.

At the same time, radical and fast changes occurred in the structure of society, which pointed to the direction of split. Although the degree of inequalities never reached the classic levels as observed in South American or Southern European poor societies, the constant fluctuations, steps forward and backwards over the past twenty five years made the situation quite difficult. The society was not split, and no social background societies were formed. However, the very slowly developing changes in the lives of those living in deep poverty, especially of the Roma, still involve a threat of lagging behind and occasionally lead to ethnic and cohabitation conflicts.

Inequalities result in a bad feeling of social well-being especially when people see that the income position of certain groups of the population and occupations has improved spectacularly, while the majority faces diffuculties making their ends meet. While in 1988–89 the difference between the average income of the lower and upper income deciles was 4–4.5 times (correlating with the inequality indicators of welfare Sweden), by the middle of the 1990s it rose to almost 8 times or even higher (TÁRKI) and has remained at that level since. The changes (fluctuations) have also continued in the recent period with some reduction or improvement. "Looking at the period between 2010 and 2014, what we see is that while in the first two years of this period the income inequalities grew significantly in Hungary (the ratio of the highest and lowest income deciles of per capital income rose from 7.2 to 9), in the second two years the above ratio fell to 8.1" (TÁRKI, 2016). However, the excessively re-politicized general public finds it difficult to accept reality, namely that in "A European comparison Hungary is one of the moderately imbalanced countries with the income inequality trends indicated above" (CSO, 2015). The same can be said about the Hungarian poverty relations and the poverty ratios. This explains how even despite some improvement the dominant experience defining social welfare continued to be social uncertainty and lack of prospects, constantly generating dissatisfaction across wide groups of society.

Looking back at the beginnings, we must understand that it was a major difficulty that the members of the public could learn about the new income generating techniques relatively slowly, and therefore the pressure on the state's income substituting role continued to be great. In its social policy, the first free, conservative, government opted for "escaping forward" from among the limited options: it introduced social legislation (which then proved to be advanced even in European terms), and involved a considerable amount of additional resources that altogether led to living conditions, which were becoming more difficult with

the crises, to be kept at a controllable level. Although the income disparities and the rapid growth of poverty increased the demand for welfare services (Tomka, 2015), despite a decline in the gross domestic product, the majority of entitlements for benefits was retained. The social security expenses were not reduced; in fact, serious efforts were made to extend family subsidies and introduce new benefits.

The first negative turn occurred in 1995–96 when major cuts were applied in almost all aspects of the welfare system. In the country that was struggling with demographic problems for decades, the most devastating cuts were applied in family policy benefits. All this happened without any positive impact on the economy or the national budget. The modest results of financial consolidation[1] did not stem from the social cuts but from the sale of the "family silver", that is, the privatization transactions involving the sale of a considerable part of public services to foreign investors, generating one-off revenues.

Thus the majority of the Hungarian society felt deprived and the society remained poor even after the regime change. Although in some periods, including e.g. the extended reconstruction of the family subsidy system after the turn of the millennium, the income position of all groups of society improved significantly, the trend did not turn out to be long lasting. It was followed by *a radical decline, the increasing tendencies of child poverty, the new debt of the country and the doubling unemployment* and, according to the date, the actual turn occurred only from 2012–2013. The "external" signs of the turn occurred in the consumption potential and purchasing power as well as employment indicators of the households.

Paddock and seesaw

The changes in the structure of society helped certain groups achieve social stability and progress, and the members of such groups have slowly lost eligibility for social care. However, the situation of others, primarily the unqualified and undereducated groups and individuals living in small settlements and in the territories continued to deteriorate, only their social uncertainty and exposure became permanent. The ethnic face of poverty involved the threat of a certain type of social background society developing partly because of its increasing mass nature and the depth of its cultural and civilization deficits. The series of failed convergence-promoting programmes proved for a long time to be ineffective. The first comprehensive, complex and *"evidence based",* i.e. scientifically founded, programme, free of any ideology yet willing to break the continuous transfer of poverty to new generations with organized, well-structured, institutionalized and significant resources was only launched at the beginning of the 2010s and it has now reached its implementation phase. In this area the unexpressed major question is whether the policy aimed at reducing poverty will be able to prevent bad situations by increasing the financial resources and using its professional convergence tools and to actually reduce poverty expressed in numbers and as ratios with the now digressively increasing demographic indicators of the poor population concerned. Without that we will only be able to see people struggling on the permanent

[1] The Horn–Bokros package.

seesaw of *existence – welfare – social emergency.* The concept of security and social security may be interpreted the least in this context.

Dignity and Modernization

It will always remain a decisive question in what direction the subsidy policy, social philosophy and, of course, intellectual and financial ability of the individual political forces and government cycles will develop or distort the social conditions. Will people and groups constantly relying on the assistance of the community and unable to activate their own power and determination be born in generation after generation? Will we be surrounded by incapable groups, constantly using up welfare goods, living on efforts of others or abusing the freedom of the choice of fate, or struggling in an insensitive social environment surround us also in the future? This is a rather serious issue that relates to the both the moral maturity and moral sense of society. Is human life dignified like this and is it dignifying to be a Hungarian in our country? Will a world of majority develop who will be able to carry the former groups on their backs? Can the requirements of Professor Rudolf Andorka related to the five conditions of Hungarian modernization be fulfilled and where are we at the moment on the expected road? In other words, can we establish a growing social market economy capable of income generation, will the constitutional democracy be achieved, will a Hungarian society relying on the middle develop with a strong middle class and not too deep and not too large poverty, where school education grows and remains high on average and, for which it is truly significant, will a civic and civil knowledge lifestyle and attitude emerge and get strength and, of course, how much did and does the Hungarian social policy add to it?

The social processes affecting social security are issues of decisive significance for the whole nation. Perhaps no one else in Europe suffered so many losses, damages and so much humiliations as the Hungarians and the Hungarian society. The greatest damage may be measured in the shock to self-confidence and in the belief in the power of the national community. Cohesive, solidary Hungarian community also needs security in financial goods. However, besides the social fears of the population and the uncertain income positions, it also must be said that the Hungarian social protection is also able to achieve considerable results. The strength of our social policy include its highly sophisticated structure and variety; naturally, in certain components we lag behind others, but we also have a lot of hungaricums which also made a number of services of our social systems an example. During the review of the Hungarian social policy of the last twenty five years, we shall provide an assessment of the system as well as the development of some features of the Hungarian family policy, which are outstanding even in international comparison. This assessment is provided with the hope that the data and facts also reflect the increasing opportunities and power of our social security.

Loss of Security

Let us take a look once more what happened to us. We could not do anything else but to do what we could. After the regime change Hungary transformed radically socially,

economically and politically. Perhaps the formal framework of the political institutional system changed most rapidly. Multi-party parliamentary democracy was introduced, the municipality system was put in place and a new political class developed, *as a result of which the structure of society was significantly transformed with the hardly tolerable patterns of inequalities.* New production and economic structures evolved and became dominant and the competition-based market economy systems stabilized with the dominance of private property, while the globalization impact constantly weakened the independence efforts and employment capability of the Hungarian economy that changed in intensity according to the government cycles.

Freedom broke out. The country got rid of the occupying army and the longest and cruellest dictatorship of our modern history even if we include the concept of "goulash communism" in it. However, as the Russians moved out, the freedom of thought emerged and the chances for national self-determination opened, however, the expected nationwide euphoria across society never took place. The country was dominated by grievous search for ways and perplexity rather than europhoric celebration. The people, most of whom have lost interest in public matters, have been humiliated in their national feelings for decades and lost their self-determination, were pushed into the social vacuum that was created by the loss of 1.3 million jobs and the lack of income generating strategy. *Thus the first living experience of the country entering the world of freedom was determined by the uncertainty of the abandoned people and not by the individual and common progress and the hopeful achievement of public trust. It was difficult to offset that feeling with the efforts of the state and government focusing on care.*

With a social policy that has lost its self-determination, the essence of the welfare system inherited from socialism was still the price subsidies that supported full employment and the basic services and consumption goods. However, the first and most miserable, totally unexpected impact of the *ugly new world* that emerged around us at a hellish speed on everyday citizens was the loss the low-level yet predictable social security. The relatively secure jobs, the generally available housing and the modest yet certain outlook of living disappeared completely overnight. Consequently, security to which people got accustomed to and which was assumed by people partly due to their apathy and lack of criticism about the system and partly as something deserved and due in exchange for lives ruined by the forty years of socialism, was lost.

Dissatisfaction was therefore understandable. From the "existing" socialism we took a step into a *struggling capitalism,* about which we had completely different dreams and which, on this side of the iron curtain, was perceived as welfare, wealth and freedom. We were not aware at all of the efforts and personal responsibility that must be undertaken by an individual living in a market economy and we could not know either how time consuming the social process was with which the social societies reached the envied level at which we believed those people lived then. There were only a few who saw across the fence and understood that only a completely reorganized society was able to provide the balance that was in everyone's dreams. The capitalist market economies often corrected their own welfare systems and created the efficient and protection systems of a social market economy specifically to reduce the attraction of socialism that they perceived as a remote regime. However, the countries change their regime were not immediately ready for the changes,

and Hungary was one of those countries. *Restructuring, especially the restructuring of the economy, is an extremely costly process. The price is mainly social.*

The Premature Welfare State and the Social Crisis

During the years prior to the change, János Kornai talked about a premature welfare state, referring to the "quasi social policy" that continued to be wasteful even besides the declining economic performance of the state socialism, i.e., the mass forced employment and the non-sustainable price subsidy system. He was talking about a state which was unable to create predictable and actual social security even with the unfounded relatively high expenditure, especially because the welfare attraction of the capitalist states near Hungary and the quality of life of their residents, which was obvious through the iron curtain, was not even comparable to the Hungarian situation. However, the crisis definitely arrived.

Among the transforming countries, the economic restructuring took place at the speed perhaps in Hungary. However, the price of speed was reflected in the magnitude of the suddenly emerging living problems, the mass appearance of *social crises,* including mainly the dramatic increase in unemployment. This resulted immediate, durable and mass income losses without the people being aware of preparing for the situation. They had to experience and learn new techniques of earning an income. But as nothing was ready, the people usually looked at the state, as it was their habit in the past. They looked to a state which inherited a rather high external indebtedness and had to account for losses in income that were even greater than the loss of income sustained by the population during the years of the economic transition amidst a simultaneous decline in economic performance and the revenues of the central budget. So the mass shortage of income appeared in the households when the revenues of the state willing to organize the social protection of its residents and to provide it in an ideal situation also reduced drastically. The civil and religious organizations re-established at that time were also rather weak in strengthening the social protection net of society. Social policy became a multi-sectoral policy in Hungary too, but the state took the main responsibility for the welfare of its citizens.

It soon became obvious that among the social problems unemployment was the most important one that created different and increasing public expenditure demands. The country also had to face phenomena that had been almost completely hidden from the public before, such as extreme poverty, and homelessness, which was perhaps the most disappointing side product of the initial phase of the regime change. Facing a large number of homeless people and the misery of their living conditions was the greatest loss of illusion in the moment of the emerging freedom. It is not accidental that in the *National Renewal Programme,* the first strategic document issued by the first independent government after the regime change, a separate chapter was dedicated to homelessness and the government immediately established a Social Crisis Management Programme Office led by a government commissioner, reflecting the seriousness of the task.

The establishment of this office, which was unprecedented in Europe, operated with a small staff, yet had relatively strong powers and disposed of a relatively large amount of funds, created unique opportunities in Hungary to respond fast to unexpected social catastrophes.

- *This is how homelessness became the first target area of social crisis management.* Obviously, at the beginning the problem could only be managed rapidly and temporarily, this was the new, almost unprecedented area of service that was able to present the most result in the shortest possible time. A complete institutional network to support the homeless was practically established in two years, starting with the establishment of a research and methodology institute, followed by the multi-step service levels all the way to the establishment of the financing and legislative environment. This branch of social protection was the first to also activate religious and civil assistance, successfully integrating them into the social protection network. The new network of services, established from "nothing" in just a few moments, still effectively assists homeless people, although it is now ready for improvement.
- Another area of intervention of *social crisis management* was the strengthening of *sub-regional protection in rural small settlements and agricultural areas.* The nationwide programme took place in the spirit of dissemination of new services that lacked any precedents but were able to respond to the actual situation and were able to strengthen the local protection systems. The village and hamlet management services, the social land schemes and numerous other solutions assisting in individual cases, such as interconnection of local economic development with employment, with local production and public services that filled the gap in the public services of small settlements, but are now considered among the best practices in Europe emerged in this depressive rural districts that were hit by excessive unemployment. The primary goal of the sub-regional convergence programmes affecting more than 160 settlements in 11 counties was to strengthen the infrastructure of the local social service system and the social load bearing and protection capacity of the small settlements as well as to bring a balance in service shortfalls.

Consequently, the social policy of Hungary during the regime change began with the elaboration of the social crisis management techniques and their operation, the organization of services aimed to improve extreme poverty and the introduction of new innovative services. The crisis management tools functioned constantly over the last twenty five years due to the sustained needs and service shortages, but the modernization of the service system and its organization into a transparent structure as well as ensuring its operability took place in the first years of the rebirth of the Hungarian social policy.

Regime and Change

At the beginning of this paper, I already referred to the first and also most important step, i.e., that *the social rights of citizens were confirmed by the Constitution,* and therefore the conditions of *the social rule of law* were all put in place. The Hungarian social policy took the next step by adopting an act on municipalities and an act on employment and the unemployment benefits. They specified the tasks and responsibilities of the social policy services of the multi-level public administration system and introduced an advanced Hungarian institution and service system of the employment policy without practically any background.

These actions were followed by the first social act of the region, which entered into force in 1993.[2] Referring to the provisions of the Fundamental Law, this act interpreted the right to social security as a constitutional fundamental right and regulated it at legislative level, thus laying down the tool set and organization of the multi-sectoral (public, market and civil [NGO]) Hungarian social policy. Just as in welfare states, the law applied the principle of *subsidiarity, labour and responsibility distribution* with a primary state responsibility assumed for the welfare and social security of the citizens.

- defining exactly the levels of services, the tasks and obligations,
- organising the services into a consistent structure, and
- introducing the system of guaranteed service minimums, which also served as an example in Europe; as well as ensuring the concept of social legal remedy.

With a separate procedure it created and, by introducing a *sector neutral normative* financing system, made the operation of the Hungarian social administration system secure and predictable. That act in fact started a process of social legislation, with which Hungary took major efforts towards introducing a solidarity-based *social market economy.*

Following the establishment of the funds and a lot of development and modernization, the Hungarian service system is still significantly more advanced and better structure than that of many rich Western European states in many aspects despite certain backlog, occasional underdevelopment and infrastructural inequalities. A good example for that is the effective structure and professional regulations of the *day care system of old people,*[3] the *support services assisting those living with disabilities and family assistance and child welfare services* etc. The state plays clearly and almost exclusively the main role in financing and in the responsibility for operation. That is the consequence of partly the special Hungarian heritage, different from the other former socialist countries, and the re-distribution practice of the governments after the regime change, which kept the social expenditures at a relatively high level in a European and regional comparison. However, we must add that in certain service areas, such as the services to the homeless, the services aimed at people living with disabilities, the care for the elderly and services and primarily interest protection of the people with a health damage and the special services and charitable activities offered to them as mentioned above, the presence and role of civil organizations, religious and other service providers continued to increase over the twenty five years. These activities added a great deal to the efforts of the state aimed at establishing security. The targeted expenditures and re-distribution ratios are a good indicator of the performance of the obligations of the state at least at the level of intentions.

[2] Act III of 1993 on Social Administration and Social Services

[3] With approximately a thousand service units.

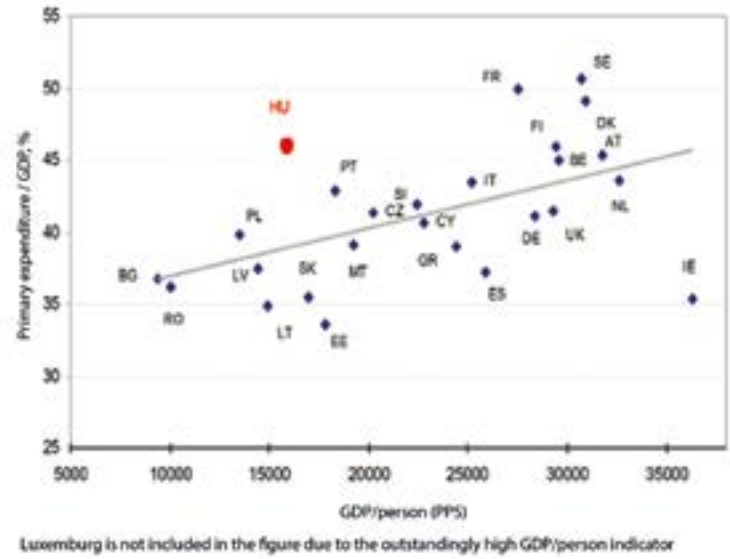

Figure 1

High re-distribution compared to the development of the economy: primarily expenditure/GDP in 2007

Source: Eurostat

However, the high re-distribution ratio itself is not a condition or a guarantee of an effective societal and social policy. It still indicates though to what extent the state intends to share its revenues with the society.[4] At the time of the regime change, the country already had child and adult protection services, a multi-level structure of institutions for old people, offered extensive services to people living with disabilities and had a wide and differentiated, although often truly inadequate assistance system that were significantly more advanced than those available in the neighbouring countries and covered the entire social sector. Especially the Hungarian family support system, with its great deal of variety and versatility was ahead and is still ahead of the European average. Naturally, it involves a higher than average degree of re-distribution by the state, which imposes a special burden and, in many cases, an excessive burden on the state budget. At the same time, it contributes a great deal to the fact which is less recognized in Hungary that *our social protection efforts significantly reduce the vulnerability of the population.* Accordingly, the Hungarian GDP-proportionate redistribution practice of the state is close to the European average and the same also existed before the regime change.

The years illustrated in diagram 2 reflect the situation prior to the global economic crisis of the first decade of the new millennium, which hit Hungary especially severely. The tendencies of that situation did not change significantly even during the years of the crisis (2008–2011).

[4] The re-distribution ratio itself does not indicate the social commitment of a state because it may also be the case that it is unable to control the budget processes.

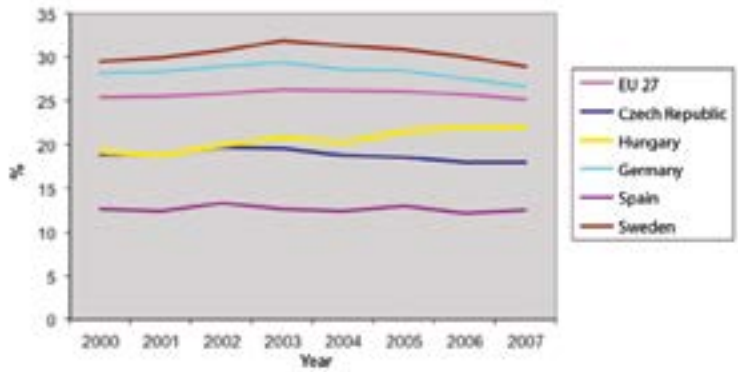

Figure 2
Social protection benefits (as a percentage of GDP)

Source: Eurostat

The high level of re-distribution entailed a relatively high level of welfare expenditures. The country continued with the tendencies that prevailed prior to the regime change without being able to significantly improve productivity or the national income generating capacity. However, the social conditions of large groups of the population did not change significantly. *The middle strata existed on the verge of the social threat zone constantly and with uncertainties,* their lack of independence in income generation and existence kept them depending on the state and maintained their employee status. At the same time, the inequalities increased significantly with a dynamic improvement in the situation of the upper income groups, while the situation of the lower income quintile and especially *of the Roma population living in deep poverty* and predominantly without any jobs, continued to be bad. Measurable and certified changes in their situation appeared only in the past three years. The low level and also doubtful stability of their social relations was the result of their permanent socio-cultural disadvantages and the crisis of the social policy practices that lacked socialization and convergence programmes until the beginning of the 2010s. Since then promising changes appeared in the situation but their durability and continuity still show some uncertainties.

Nonetheless, in relation to the poverty indicators, it is important to note that in terms of the poverty reducing impact of social benefits, Hungary is in a very good position in an EU comparison. In comparison with the other EU Member States, the financial benefits in Hungary are an important income supplement. Those with low incomes earn a considerable part of their revenues from financial benefits. In terms of the poverty rates calculated with and without the social benefits, the Hungarian indicators are much higher than the EU average and are comparable to those of the Scandinavian countries.

Consequently, the effective targeting of benefits and their poverty reducing impacts are obvious even with the known fact that the share of the most widely spread social incomes in the revenues of the households in need were decreasing already in the first decade of the regime change. It therefore seems to certify the position according to which the performance and targeting of the Hungarian assistance system is clearly remarkable. In the heat of the arguments, the Hungarian general opinions on social policy usually disregard that fact.

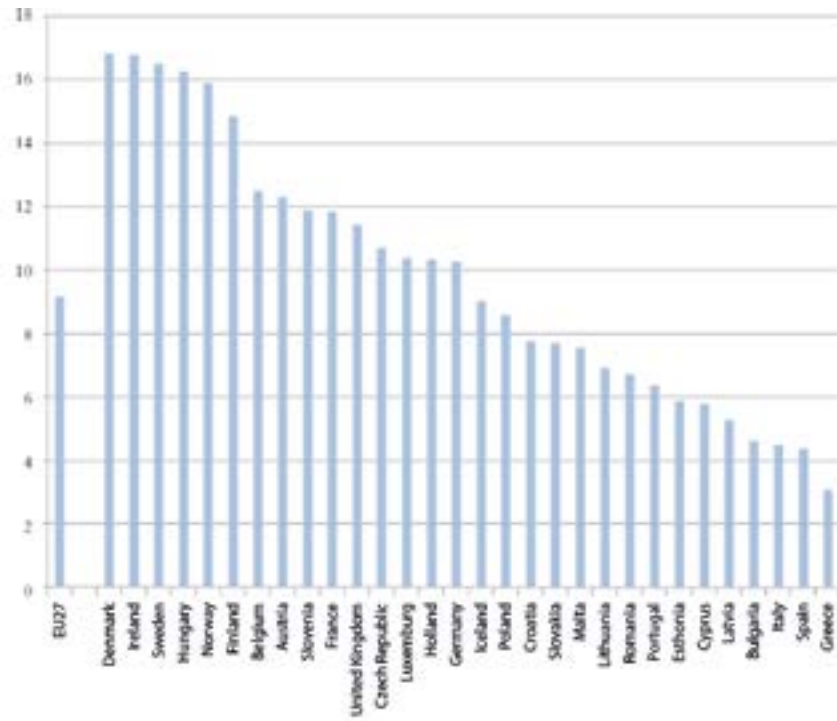

Figure 3

Five-year average of the differences in the poverty rates calculated with and without the social benefits, 2005–2009

Source: Eurostat, Statistics database, http://epp.eurostat.ec.europa.eu

In order to avoid social political disputes, we should continue our discussion by assessing the processes that are sufficiently supported with data. Due to its relativity, security and everyday social security is primarily a subjective feeling, yet we have social indicators and data that indicate both the strengths and weaknesses of social protection. As our welfare security is based primarily on the independent income generation options, let us take a look at the unemployment and employment data of the period sice the regime change.

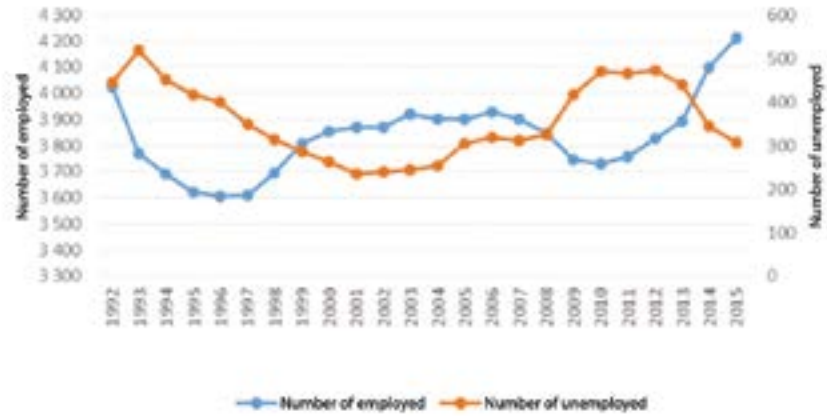

Figure 4
Number of employed and unemployed (thousand people)

Source: CSO, 2016

The absolute figures illustrate well the importance of the phenomenon and its impact on social well-being and, of course, on income earned from work. In this case, it is also worth paying attention to the statistical proportions and their tendencies.

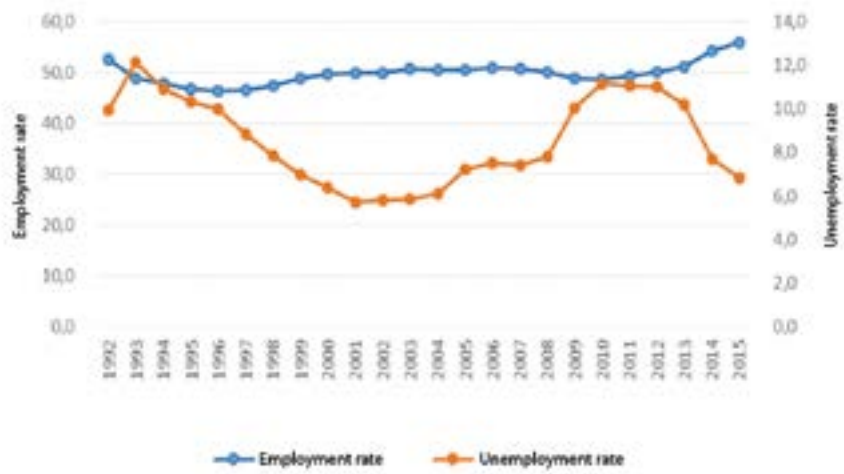

Figure 5
Employment and unemployment rates (%)

Source: CSO, 2016

The figures serve to illustrate well that, following the initial dramatic processes, the employment ratios were extremely low until 2012–2013, making Hungary lag behind the European average. In this context we can talk about a real turn because the improvement of the data was not only due to the extension of the public employment scheme as a partial reform of the assistance system, but also a dynamic increase in the primary labour market. At this point we must also note that at least part of the group of public employees, in the past living only on social benefits with very low labour intensity and predominantly inadequate education left behind total passivity and more than 10% of them found legal jobs in the primary labour market.

The same picture is also confirmed by the unemployment data, i.e. the data indicate a real turn. After the long and lean years, we experienced continuous improvement following the negative peaks in 1993 and in 2010. The 2016 August figures indicate 5.1% unemployment, which was close to the favourable figures of the turn of the millennium, but with which Hungary is still below the EU average. It is a question whether the dynamism of economic growth will be enough to employ more people and whether the increase in the employability of the undereducated groups can maintain the current base.

Poverty (also the poverty of others) has rather unfavourable impact on our social well-being and weakens our security awareness. The economic crisis that broke out in 2007 hit the Hungarian economy and the national budget in a rather weak condition and therefore the social impacts appeared in Hungary exponentially. The 1995–1996 phenomena seemed to be repeated when the unsuitable management of the fall in the performance of the economy triggered severe social consequences, growing inequalities, fast dissemination of poverty and another shock to the position of the average income. The improving economic and welfare results of the years of the turn of the millennium were almost lost after 2005 and the lack of social security was dominant across the country again. Poverty began to rise dynamically again, including especially child poverty, and Hungary lagged behind the regional averages with almost all indicators. Although the discussions and messages of the daily political arena make it more difficult to see clearly, the figures show that also in this area the turn occurred in 2012–2013.

The TÁRKI Monitor report indicates that "besides the income poverty, the other two elements of the EU2020 three-component poverty or social exclusion indicator showed some improvement" (Szivós–Tóth, 2015: 4.). The ratio of *those living in severe financial deprivation* fell from 37% to 28%, and the ratio of *people living in very low work intensity households* dropped from 15% to 9% between 2012 and 2014. Consequently, the ratio of those living in poverty or in social exclusion defined in the EU2020 indicators decreased significantly: while in 2009 and 2012 approximately two fifth of the population fell in that category, the respective figure was only 35% in 2014. The CSO research also matches the above. The fault lines of improvement have strong contours and indicate tendency-type processes.

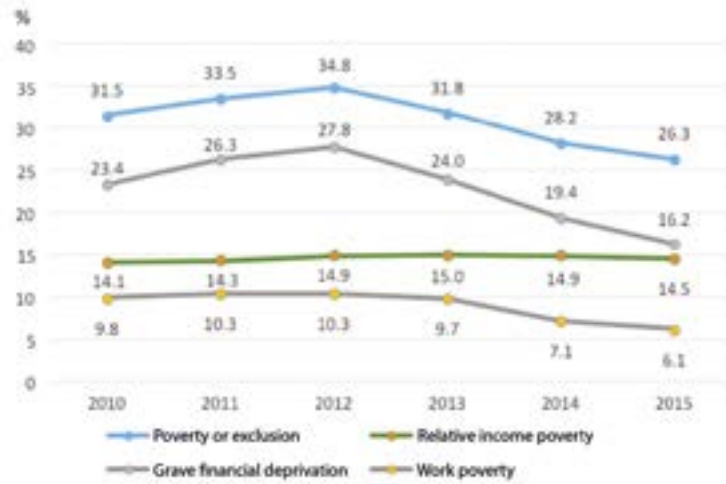

Figure 6

Ratio of those exposed to the risk of poverty or exclusion in certain types of households

Source: CSO, 2015

The details speak more than the data of the full population. They indicate that the poverty ratios continue to be very high, approximately 77%, among the unemployed, but there is obvious improvement in each type of households with and without children and among the pensioners.

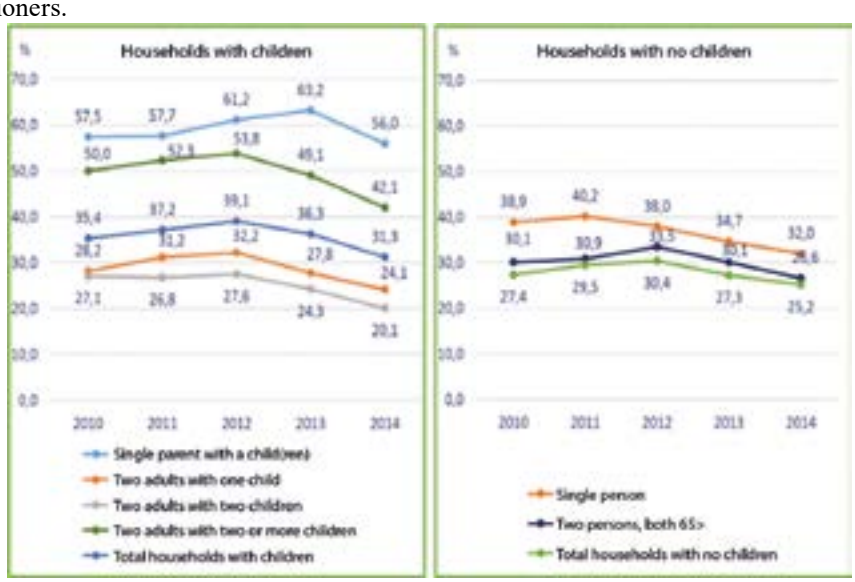

Figure 7

Ratio of those exposed to the risk of poverty or exclusion in certain types of households

Source: CSO, 2015

Situation of the Roma

With the establishment of the National Social Convergence Strategy (NTFS) in 2011 and the controlled and planned implementation of the programmes, Europe's most significant Roma convergence programme started in Hungary. The recognition of Hungarian professional and partly political circles as well as the fact that the EU used the Hungarian programme as an example to be followed by the community, all illustrated the recognition of the strategy. However, the results came slowly, yet among the social policy tasks Hungary faces, perhaps the promotion of the convergence of the Roma, is the most urgent task. In order to make up for the lag of many decades not only in a national programme laying on the basis of the social well-being of the full population is required, which could be fully satisfied by a strategy, but it also needs the wide acceptance and understanding the fact that the internal peace, stability and also security of the country depends on the successful work performed in that area.

Table 1

Some poverty indicators of the Roma population (%)

	Roma	**Non-Roma**
Relative income poverty ratio	63.1	13.7
Ratio of those living in severe financial deprivation	67.8	18.1
Ratio of those living in very low work intensity households	26.7	6.6
Ratio of those exposed to the risk of poverty or social exclusion	83.8	26.8

Source: CSO, 2014

The data estimated by TÁRKI "for 2014 shows the reduction of occurrence of poverty […] among the Roma. Consequently, the difference between the Roma and non-Roma reduced, although it is still more than four-fold." As an explanation of the major decline, it can still be stated that "the transformation of the risk character of the traditionally higher risk and lower status groups is likely to be interconnected with one of the most significant employment and/or social policy transformation of the past and the significant extension of the public employment programmes (as well as the cuts in the unemployment benefit system." The disputes relating to the extended public employment programmes can be slowly closed by the facts because the research revealed that "almost 50% of the resulting income goes to the poorest 20% of the population and 37% to the second poorest twenty per cent. With that the public employment income is better targeted than the job search allowance" (TÁRKI, 2015). What is perhaps more important is that for many decades it has been the only solution with which those living in rather low work intensity households can leave behind their passivity and some of them can even enter the world of legal employment.

However, we must add that despite the improvement, with the still unfavourable and slowly changing data, a turn in the convergence policy can be brought by the approach to the strategy and thoroughness and continuity of implementation, i.e., that could form the basis of social security among the population concerned. In the implementation of the strategy, it deserves special attention that the measures aimed at breaking the spiral of reproduction

of poverty reach the Roma community from early childhood. Aimed at overcoming the disadvantages of socialization in early childhood, the work from the Secure Start Children's Homes through the kindergarten attendance, lowered to the age of three years, the second chance-type programmes of primary and secondary schools to Roma special colleges in higher education will sooner or later bring the expected results. The involvement of the majority of adult, mainly untrained Roma, workforce into activities combined with training is expected to generate results slowly with additional social benefits, measurable also in the easement of cohabitation conflicts.

Territorial Inequalities

The territorial data of social security in Hungary are rather thought provoking. The social spatial structure of the country has traditionally shown an East-West type asymmetry. Within the framework of this study, the data cannot be analysed in detail, only a few important characteristics can be highlighted.

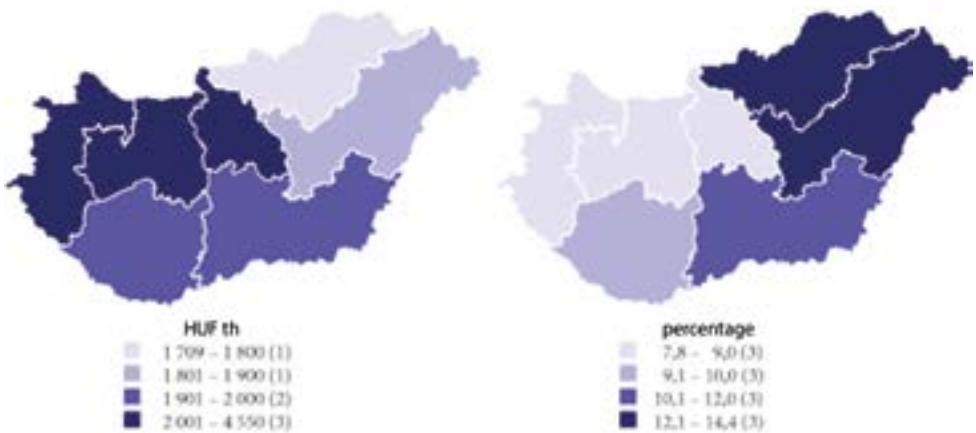

Figure 8

Per capita GDP (HUF thousand) and the unemployment rate (%)

Source: CSO, 2013

The *inverse ratios of economic performance and unemployment* have determined the directions of economic development and social convergence planning for decades. In that respect intensive and targeted work and the allocation of EU development resources bring results only slowly. Without those the territorial aspects and hopes of social security will not change. However, it must also be taken into account that at the end of 2012, 93 of the 175 small regions in Hungary were in disadvantaged situations, of which 47 belonged to the least favoured areas (LHH). In addition, approximately 10% of the total population live in those small regions. They face increased poverty risks due to their accumulated regional disadvantages and therefore their chances to exit may only be increased with targeted, complex and organized state intervention. The territorially targeted programmes of NTFS are also present and emphasized in the LHH small regions.

Summary

Putting in place social security is one of the main conditions of the security feeling and stability of the Hungarian society as well as avoidance of social conflicts. This requires a predictable and accessible effective care and service system, capable of responding flexibly to various situations in life. Hungary is not in a bad position because, with continuous development and modernization, our nationwide social systems organized in networks can usually cope with the various intensity load imposed on the social net. The Hungarian social security operating with state responsibility also operates the health services and services designated for old people at a level, which complies with the general European standard. Owing to the continuous enforcement and enlargement, our family support systems also function at a level that significantly exceeds the European level both in terms of diversity and quality. It may sound slightly shocking but, in agreement with the demographic experts, I must say that their efficiency may be measured primarily in the fact that despite the negative expectations the demographic crisis has not intensified even more and, in fact, the data have indicated a positive turn recently.

The degree of organization and targeted nature as well as quality and efficiency of the Hungarian social institutions and services are among the important factors of the occasionally shaking security feeling of the Hungarian population. Nonetheless, we should also concluded that social security cannot be achieved with merely social policy instruments. It can only be achieved by a consistent social policy that also protects the middle classes and is complemented with family and demographic policy protection measures and which acts against poverty and the reproduction mechanisms of poverty by (also) forming a complex economic and employment tool set.

Humane economy, humane society – This is the main principle and basic objective of the social market economy, i.e., a Hungarian economy, strong in employment abilities and equitable economic and social operation covering also market conditions can constitute the basis of our progress. In relation to that principle, an independently strong policy can contribute to the improvement of our quality of life, to security and stability and to the achievement of a social rule of law, defined in the Fundamental Law.

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Miklós Szócska – Tamás Joó

Health security issues

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Abstract

This chapter aims to clarify the framework and the different definitions of health security as well as to assign its most prominent challenges. Epidemics and pandemics, activisms on vaccinations, emerging new viruses and bacteria strains, the new challenges originating from lifestyle and altered health behaviour, the role of sovereignty in decision-making will be discussed during the subchapters in more detail. Thanks to the vaccination system of Hungary, classic epidemics do not threaten our country; however, certain opinions appearing in social media on vaccination give rise to concern. The new, emerging resistant bacteria strains are having significant effect on a number of sectors of the national economy, therefore, multisector collaboration is inevitable to reduce the risk. Additionally, the increasing spread of noncommunicable diseases manifest itself in new challenges. When providing answers and solutions to the challenges it is essential to assure sovereignty as well as supporting long term decision making instead of adapting short term decisions. In this chapter healthcare as a source of data will also be described and a short analysis will be carried out concerning the challenges and health security risks in the field of healthcare data collection.

Keywords: health security, pandemics, vaccine, data analysis, biologic, chemical, radiological materials, social media, healthcare, ebola

Introduction

Our personal security concerns are present in our everyday life. We take care of our valuables when travelling on packed vehicles, air passengers got used to airport security measures and citizens collaborate with the authorities in case of natural disasters or terror threat. We rarely think about health security, only usually when we are threatened. The rise of worldwide pandemics, food poisoning, quarantined cruise ships, infected animals to be slaughtered, sudden deadly infections, hospital infections and news about healthcare

institutions on the verge of insolvency usually reach the stimulus threshold of the different news networks. Since the centres of worldwide pandemics are far from us, most of us do not even think about the tangible dangers and worldwide background trends threatening the security of our health and of the systems set up to enhance or restore our health. Most of the times we speak about our health and health prevention with our general practitioners or our close relatives and we gain experiences and make judgments concerning healthcare during our personal or family visits to clinics and hospitals. In Hungary, the media informs the public most notably along the health policy programmes and developments and public health campaigns, maybe scandals that fit into the political communication.

As a first step, it is worth clarifying what we mean by health security. International literature lists these issues under the definition of *health security, global health security* (GHSA, 2014). Primarily and in the narrow sense of the expression, challenges of biologic, chemical, radiological materials, worldwide pandemics or pandemic influenza and the tasks of epidemic control are grouped into the subject area of health security. In the European Union and in the world in general, health security as well as health policy and the arrangement of healthcare is considered a national responsibility. It is a common experience that if we address countries that are unable to defend themselves against epidemics with epidemiological and health safety interventions, then these countries consider it as a violation of their sovereignty, and the course of urgent interventions freezes. In the most recent times, however, by way of global connectedness, initiatives for global collaboration and mobilization have enhanced. *World Health Organization (WHO)* is also setting up their emergency medical teams in the framework of global mobilization (WHO, 2014), certain major powers downright initiate setting up groups with special worldwide sphere of authority concerning epidemics which is fiercely opposed by other major powers. The authors themselves who deal with health security are also forced to exceed the narrow definition of health security when they face new challenges or they have to deal with other sectoral or social factors that define health security. We are convinced that the domain of health security should be defined in a sense that is much broader than its textbook definition, therefore we use a more courageous definition and we construe health security issues along broader criteria. From their 1991 strategy (NATO, 1991) on, the NATO our safety and federation ally also uses a broader approach which is also of help for us.

Margin for interpreting health security

In this subheading, we are trying to summarize the most important challenges of health security and the relevant tasks: we give a short definition for health security and list safety policy, health policy, professional and the citizens' tasks with short explanations. In the last century, mankind has achieved impressive results against the main epidemiological challenges and challenges related to biologic, chemical, radiological materials that threaten the basic conditions of the biological existence of the human race and eradicated pathogenic agents that used to be able to depopulate even a continent. However, we need to be aware of the fact that nowadays the leading causes of death are not communicable diseases and worldwide pandemics but chronic, non-communicable diseases, i.e. diseases resulting from our lifestyles. Therefore, we have to classify several other factors into the subject area of

health security which affect the health of the nation, the vulnerability and sustainability of the health prevention and health recovery system or the sovereign decision-making related to them and its influence.

Information technology improvements not only established new opportunities, but also brought new health security challenges to society. Hungary is not an exception to this either. In Hungary, health accounting systems have been functioning since 1993 which result in the generation of a large amount of electronic data. The security of and the use of these data for safe treatment, research and decision-making purposes is also a strategic fundamental question regarding health security.

Another study in this volume addresses the issues related to the access to clean water and the threat to the clean water supply. The traditional health security considerations regarding chemical and radiological materials are well-known and obvious since Chernobyl or the Hungarian red sludge catastrophe. What we breathe in, what we eat or drink, what is absorbed through our skin, the noisy environment, the materials of the built environment, the new chemical materials, the appearance of contraceptive hormones in our waters—there are detailed studies regarding all of these factors that affect health and even fertility and population growth. Complex researches demonstrate the relationship between the worse morbidity statistics of the people living near airport runways or the incidence of lung cancer in people living in the smog in a developing economy, however, in general at present the considerations of short-term economic interests are globally stronger than that of long-term sustainability. SDG *(Sustainable Development Goals)* is a significant experiment in order to emphasize the issues of sustainability, including the issues of the sustainability of health (UN, 2015). Nowadays, these principles apply without an implementation strategy and institutional fundraising, on the level of a globally adopted declaration.

The response potential of Hungary to the challenges of biologic, chemical, radiological materials concerning epidemics is exemplary even in an international comparisons due to the hygienic civilization, the advancement of the system of vaccination thanks to Semmelweis' heritage and the lessons learnt from the efforts made in order to overcome tuberculosis. From the epidemiological point of view Hungary is safe, we have a suitable biologic, chemical, radiological institutional system in place to take care of health security. In the past decades, this institutional system has been reorganized several times in order to enhance its efficiency for which the reason was the inertia of the overgrown bureaucratic system. The experiences of the series of reorganizations are still to be processed in several aspects. On the one hand, it is vital to maintain the operational character of our health care system during the reorganizations. On the other hand, it is still not sure whether our healthcare authorities working along bureaucratic solutions are able to demonstrate sufficient flexibility against the new challenges. Thirdly, the extent to which short-term industrial policy interests prevailed against long-term health interests during the reorganizations is still a question.

Challenges of health security

Worldwide pandemics in the form of emerging diseases pose a previously unknown threat. Avian influenza, ebola and zika pandemics demonstrate well the types of challenges mankind have to face as a consequence of global warming and environmental changes (Patel,

2015). Unknown pathogenic agents become activated and the so-called vector organisms (e.g. certain species of mosquitoes) which "transport" them gain living space where they have not been expected to appear so far. Due to globalization, Hungary is exposed to the danger of worldwide pandemics, even if these are expected to outbreak in distant continents. We have safety laboratory and vaccine production capacity with regional competences, our experts participate in the global control, however, they are working under tight financial conditions. The experiences of flood control, the solidarity in these cases and the existence of a united disaster management organization equips Hungary with the ability to take appropriate actions in case of a crisis.

The real question concerning worldwide pandemics occurs on the global level. Will we be able to predict the emerging worldwide pandemics, recognize them in time and to mobilize enough resources for technological development necessary for their control? Are we able to organize the support of the developing world in an epidemic emergency and to communicate correctly via global mobilization and cultural sensitivity? How fast will we be able to develop vaccinations and medicines against the new pathogenic agents (Wolicki et al., 2016)? After the frightening experiences gained regarding the previous avian influenza and later ebola pandemics (Heymann et al., 2015) major progress has been achieved in the communication during the control of the zika virus, however, even this could not offset the press panic following the correct professional communication, which seriously affected for example the organization of the Olympic games in Rio. This phenomenon demonstrates well that not only pandemics but also the distorted perception of the dangers related to them and the unnecessarily heightened sense of danger and scaremongering may also have serious consequences. The epidemics risk, the management of pandemics depend on civilizational development and health literacy.

Vaccination and activism

Trust in the Hungarian vaccination system plummeted during the political scandal related to the non-transparent vaccine production contracts of avian influenza epidemics. After 2010, the vaccination system has been successfully stabilized and in 2013 extended along the consultations with professional medical organizations and patients' associations. In the first year 80% of the parents requested HPV vaccination for their children—based on this and the high vaccination rates on the global level, it can be stated that the Hungarian vaccination system performs exemplary. Industry-trade lobbying and anti-vaccination activism are the two factors that are of moderate threat to the vaccination system. The trust in the vaccination system can be easily shaken by an uncertainty concerning procurement. The tactical elements of the industrial competition for the markets (the competition of the market operators concerning the procedures) may easily damage the procurement, delivery and, as a consequence of the former, the vaccination deadlines. Based on the analysis of the Hungarian-language Facebook groups, anti-vaccination activism can be considered limited, they intervened unsuccessfully during the introduction of HPV vaccines. However, in recent years the international anti-vaccination lobby has expanded in a dangerous and spectacular, Hollywood-like manner. There are religious communities worldwide which are against vaccination or other medical interventions. Many of these operate serious epidemic

information systems in order to protect their adherents (e.g. protestant fundamentalist groups in The Netherlands). Due to its vaccination rate and hygienic development, Hungary is not threatened by traditional pandemics, not even as a consequence of migration. However, due to wars and regional conflicts millions of people are becoming inaccessible for the vaccination systems. Therefore, maintaining the vaccination rate, the continuous development of the vaccination system the transparency of the procurement system and following the activism are fundamental interests of health security and these should be treated as a subject area of constitutional protection.

Resistant bacteria

From an epidemiological point of view, the resistance of pathogenic agents against antibiotics is the next health security challenge. Resistance has been developed due to human and animal medicine practice. Irresponsible medical practice, the patients' poor medication adherence, failure to cooperate (*compliance, adherence*) and antibiotics administered irresponsibly and in great quantities in order to increase farming yields in agriculture as well as the lack of control all contributed to the development of pathogenic agents that are resistant to antibiotics. Two more factors hastened the premature exhaustion of the most advanced antibiotics. On the one hand, the medical profession, the researchers and the pharmaceutical manufacturers have been following with euphoria the spectacular results in the combat against infectious diseases and have already begun to talk about the end of the era of infectious diseases. The desire and inclination to research diminished, the industrial innovation investments available for antibiotics development flooded to other, more profitable sectors, production profitability has declined sharply. On the other hand, marketing related to the introduction of the new generation of antibiotics also had an adverse effect. Doctors want their patients to heal quickly and surely so they tend to choose the medicine that has the best possible results, while patients try to get the medicine that shows its effects sooner. As a result, mankind has used and exhausted the newest generations of defensive tools against bacteria sooner than expected therefore it might be left without effective protection. It is vital for mankind and for the governments and authorities to find new forms of protection against one of the most important challenges regarding health security by way of professional mobilization, regulation, control, investments and incentive business models and coordinate the aspects of human and animal medicine as a coherent whole. Sovereign decision-making that controls related short-term business interests is a vital issue that affect the fate of mankind.

Health security in treatment

In the context of healthcare, by health security we mean the reduction and the prevention of the occurrence of unintended harm related to healthcare and guarantee of patient safety. The notion of adverse event refers to a negative event that is the consequence of healthcare and is not linked to the disease itself, as, for example, a damage resulting from a wrongly administered medication or a hospital infection developed after a surgery. In the background

of these, the weaknesses of healthcare processes are usually identified. The incidence of adverse events therefore closely connected with the organization of healthcare.

Two forms of adverse events may occur: on the one hand, we can speak about preventable events (e.g. confusing medications in similar packaging) which can be avoided through appropriate measures and process controls, on the other hand, not preventable events (e.g. the development of unknown allergic reaction to a medication that have not been administered previously).

Errors do not always lead to an adverse event. If the error is detected and corrected in time it is the so-called *nearmiss* (e.g. when the patient's right eye is prepared for the surgery and during the checking of the administration—still before the surgery—someone notices that it is the left eye that needs surgery). The detailed analysis and research of near misses and actually occurred adverse events is of utmost importance for the prevention of events evolving later and for similar reasons. Finding systematic errors and learning from them are supported by the anonymous patient safety report and learning systems. In Hungary, the "unexpected events" (NEVES) report system and the recommendation for the management of single, serious adverse events called "procedure for the management of unexpected events" (NEKED) was developed according to the WHO recommendations published in 2005 (Lám et al., 2016).

Besides the analysis of the report results, detection and management of healthcare risks, of process control, the application of protocols and directives, the arrangement of responsibility relations and the development and sustainability of organizational culture supporting patient safety all play an important role in the prevention of adverse events. Therefore, for example, a special healthcare risk factor is *burnout*—among other things, this is an aspect that makes the earlier high rate of doctor and nurse migration a health risk in Hungary.

Health security aspects of health

In the field of health security, citizens have an active role as our habits and lifestyles can influence the fulfilment of systemic goals. The health security measures' aspects related to public health diseases and death and budgetary matters are the fundamental questions of the sustainability of a nation, a country. How long do we live? Moreover, how long do we live in health and illness? Compared to our rivals and allies how will the health and mortality of the population evolve? What resources are available to us?

In recent years, Hungary has become the focus of international attention in this area as during the peak of the global economic crisis it has been able to quickly take such pioneer, sovereign and significant health policy measures, such as the total ban on smoking in closed public spaces, the introduction of public health product tax (NETA), enforcing the trans-fat content of foods below a safe limit value, introducing everyday exercise in schools and strengthening and expanding the vaccination system. In Hungary it has also taken the regulation in favour of smoke-free environments a long time to be passed which otherwise was supported by the majority (even smokers). Smoking has proven to be harmful to health, prohibiting it saves lives and health. The life years lost, healthcare costs, the production losses because of sick leaves as a burden on national economies have also been proven to outweigh the related budget revenues. Parties having adverse interests – groups thinking

that the ends always justify the means – could successfully hinder the adoption of more stringent regulations in many countries. Their main arguments – typically the loss of jobs, the flourishing of the black market and the economic loss due to tax revenue losses – lead many economic and political decision-makers to withdraw. Withdrawal happens in spite of the fact that smoking threatens the national economy and in particular the sustainability of social and healthcare systems through diseases, sick leave or even through the exorbitant costs of oncological treatments and the consequential economic burden of death.

Public health product tax (NETA) is a leading example at international conferences on public health. It is known as an innovative fundraising tool which can simultaneously achieve with 40% of the manufacturers the reduction pf the quantity of salt and sugar added, the 25-35% reduction of consumption and the creation of the basis for wage increase for doctors and nurses (WHO, 2015). Levying the NETA had multiple objectives: on the one hand, similar actions motivate the industry to make profit with more healthy products. A global food company announced recently that by changing the structure of sugar crystals it was able to significantly reduce the sugar content of its products allowing a nearly identical perception of sweetness. This result is a good example of the fact that the industry is trying to adapt to the ever-increasing demands of movements related to food limit values. On the other hand, however, opposite direction lobbying becomes active, stronger and refined. Luxury goods that are sweet, salty, can be smoked or drunk result in burden of disease via addiction related to them. The vital interest of the industries that benefit from this is maintaining and achieving the most permissive regulation. The aspect of regulation related to health protection will have its breakthrough results only decades later. Therefore it is a key question whether we make decisions regarding healthy eating, smoking and alcohol consumption in a sovereign manner or individual or probably industry interests prevail in the decision-making.

The regulation related to health protection will have its results only decades later. Based on the logic of the national budget, a decline in 10-15 years' time regarding sick leave or premature death is difficult to interpret now regarding the budget balance. At the same time, the results that can be achieved via regulation are well illustrated, for example, by the 2-3 decades shift of the peak of US smoking and lung cancer mortality rate as well as that of the downward curve (see Figure 1) (The Tobacco Atlas, Fifth Edition, 2015).

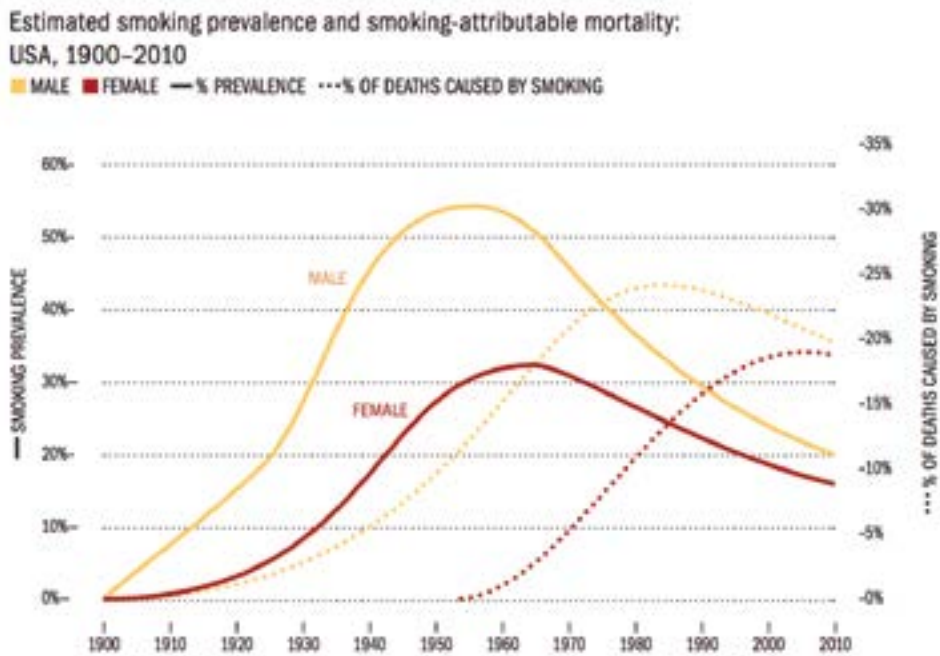

Figure 1

Estimated smoking prevalence and smoking-attributable mortality of men, United States

Source: The Tobacco Atlas, Fifth Edition, 2015

Therefore, in our country which tops the lists of cancers and cardiovascular diseases and has a low reproductive rate, the long-term maintenance of health protection regulations is of vital interest. These regulations are to be construed as a long-term sustainability investment and their loosening constitutes a health security risk. This is why it is justified to follow the influencing activities regarding these issues on constitutional protection level.

Sovereignty in decision-making

The issues concerning the sustainability of the supply system and the sovereignty of the decisions related to the supply system are also grouped into the subject area of health security. Maintaining a sovereign decision-making space is a fundamental national interest. The influence of this due to opposite economic or other interests arises as a fundamental question of sustainability and health security. Are we able to produce the most health benefits from our scarce resources? We can bring together enough resources to maintain the risk pools? What medicines do we spend money on and how much do we pay for them? Do our procurement systems achieve the most effective results? What kind of instruments and what size of instrumentation do we work with and how effectively do we use it? How many do we spend on their procurement and maintenance? Are we able to manufacture or produce the strategic stocks or do we have to purchase them elsewhere?

Over the last decades, the issue of the supply system and its certain components and the privatization of our health financing system and the development of capacities have been repeatedly on the agenda. Beside the fact that within the framework of our constitutional system we are certainly free to decide on the supply systems, it is reasonable that efficiency issues are key factors in decision-making. Experiences with hospital property or with outsourcing and privatization of certain critical service or profitable hospital substructures (diagnostics, pharmaceuticals) is negative. Privatized institutions or institutions with privatized management were not sustainable, they got deeper into debt compared to institutions of similar size. The social consequences of privatization attempts were always end up to be guaranteed by the state or the local government. In all the cases, an important strand of privatization attempts was moving the suppliers within in the sphere of interest of the owners into hospitals (from the buffet through the supply of medicinal products even to hiring hospital workers from services companies). Thus, it can be stated that profits associated with operation were privatized whereas the negative consequences related to operation and sustainability in every cases appeared on the level of the state or the taxpayers. The privatization of the social security system at the dawn of the global economic crisis have luckily failed. As a thought experiment, however, it is still worth following through what would have happened to the assets of our privatized social security funds or with the resources of healthcare during a world crisis. These are resources worth hundreds and thousands of billions of Hungarian forints therefore the influence of the related decisions is a natural supplier and investors' interest. The fundamental question is that how sovereign efficiency considerations are during decision-making and to what extent intentions to influence and effects are obvious to the decisionmakers. What is at stake is how much health benefit we are able to produce or restore with limited resources and whether social justice concerning the availability of healthcare is damaged; whether the imbalance of this (e.g. the burdens of the waiting list of people with no influence) jeopardizes social peace. These considerations are applicable to the questions concerning both the fundraising and -managing social security system and the management of the supply system and its components.

Different activisms regarding health security

In health security issues related to the health care system, special attention is paid to the political and interest protection activism. A good example was the healthcare strike in 2012 in Slovakia in which professional and labour organizations began to fight for wage increases. Night shift workers abandoned their workplace and those who worked on the day shift did not come to work. According to reports, patients on pulmonary ventilators at intensive care units were left unattended and the management helplessly tried to recruit temporary workers from the neighbouring countries. Their such attempts were hampered by the fact that the persons on strike had coordinated their action with the doctors' association of the neighbouring countries so only a limited number of volunteers and army surgeons arrived. Special attention should be paid to the form of the organization of the strike. Not all the doctors have been invited to strike, only the ones who disposed over workflow that is critical from the point of view of cure, i.e. who work in the fields of intensive care, surgery, traumatology and gynaecology. Not all the representatives of the professions playing

central roles participated, however, the exit of this critical mass from the system did result in the disruption of it. Later the collection of the signatures of Hungarian residents also aimed at central actors and threatened with the possibility of the disruption of the healthcare system. The different phenomena naturally associated with civil democracy highlighted the vulnerability of healthcare systems: the system can be quickly paralysed by an attack at the allocation points of scarce resources.

All these draw attention to the procedures, the rules of healthcare safety and to the need to plan the capacity and logistics of the preparedness for critical situations. These principles are also true to the reconsideration of the vulnerability of the critical central elements of healthcare infrastructure. To avoid misunderstanding, it is important to underline that this is not to express reservations concerning political activism; however, we must see that in certain cases activisms aim at proving the malfunctioning of the healthcare systems, even at the price of causing the system to fail.

Examples of different social activisms are those organized around religious criteria which, in radical cases, are not content merely spreading their doctrines but also attempt to enforce them onto others even by influencing state authority. These may include doctrines pertaining to the prohibition of tissue reception or transplantation which may result in damaging or destroying valuable life-saving stocks. Such an activism may result in hampering professions (e.g. psychiatry) prohibited by religion and their institutions. Religious activism is usually paired with medicine-related trade, fundraising and profit-making quackery that is harmful to health. Animal welfare activism, in particular if it affects the animal houses of priority laboratories (or laboratories related to epidemiologic safety) also poses a health security risk.

Health security, decision support, data analysis

Information technology improvements have not only established new opportunities, but have also brought new health security challenges. Hungary is no exception to this either. In Hungary, health accounting systems have been functioning since 1993 which result in the generation of a large amount of electronic data. The security and the use of these data for safe treatment, research and decision-making purposes is also a strategic fundamental issue regarding health security.

One of its aspects is the availability and safety of patient data. Data, especially data available in time, saves lives. We may forward patient data from the ambulance, the ambulance doctor may search for the place of regular care of the unconscious patient or supply electronic healthcare services to chronic or acute patients. Moreover, if our doctor has access to our diagnostic data, we are able to save public funds by the abandonment of any unnecessarily duplicated procedures. However, such data are confidential, therefore their safety is a prime factor which raises serious technical and work arrangement questions through governing the eligibility and technological security. The influence of the Iranian nuclear program is a good example for the damage a digital attack may cause in the physical infrastructure. This logic may affect even medical devices.

There is a worldwide combat for the control over data. Social media service providers and smartphone ecosystems began to introduce applications that collect data regarding

health and lifestyle. On the one hand, the availability of applications regarding lifestyle, which may even have impact on public health, is to be welcomed. On the other hand, big data may help the researchers understand diseases, discover new treatments or develop therapeutic artificial intelligence. It is a question of health security as to who controls the data. Do data serve private or public purposes or maybe quackery marketing or other trade activities that violate the ethical boundaries of healthcare? Therapeutic data may support the organizers of healthcare and even suppliers to make immediate business decisions. Which medicines are prescribed by the doctors, what kind of illegal incentive should the manufacturer pay? What kind of medicine heals the patient, what should be a part of the healthcare protocol? Therefore the use of data saves lives and public funds and is also suitable for marketing and for facilitating decision-making related to system efficiency. Obtaining and controlling of the data is crucial therefore it needs to be managed as a health security strategy issue. Social media service providers and multinational companies which supply hospital information systems acquired competitive edge in a hidden way, however, data protection fetishism characteristic of the 20th century healthcare does not address the hazards involved in this. Nowadays 21st century data strategy responses are needed to address the issues of control over data, public access to data should be provided and vulnerability of the individuals and communities against monopolistic data controllers should to be prevented.

The genetic data used for the highly developed technological diagnostics and treatment of cancers is of particular importance. One of the most promising therapeutic option is the precision treatment targeted based on the genetics of cancers. This means the medication is administered by targeting based on the genetic material of given cancer cells. This technology raises the theoretical possibility of administering genetically targeted toxins into groups of people with given genetics. This opens up a possibility of a real genocide. Mining genetical information and building data bases are vital for the development treatments for diseases that are incurable today so the management of these problems should be addressed. However, we have to be prepared for the management of the hazards involved in this so conducting related philosophical and ethical debates is imperative.

Summary

In this study, after linking the subject areas of healthcare and safety, we discussed the interpretative framework of health security in particular regarding global tendencies in diseases and the Hungarian institutional system. We discussed in details the main challenges of health security we are currently facing such as activism regarding vaccination, the resistant bacteria, patient safety, the role of health, sovereignty, and the importance of data analysis.

General experience regarding health security is that the breakout of worldwide pandemics causes alarm, opens up the channels of donation and later, as the danger passes, attention deteriorates, donations cease and the resources for the investments necessary for systemic control are not available. At present, WHO's emergency fund is filled up to 25–33%. Moreover the budget for the defence lines of epidemiology and 20% of the entire staff of WHO are cross-financed from donations given for the prevention of polio. Donations for polio that can be overcome in 1-2 years cease in 1–2 years, and WHO does not even have an organizational unit engaged in fundraising. Nowadays, global health security control depends on

occasional donations. One particular individual along with other donors engaged by him play a prominent part in the life of the institutions of epidemiological control. Bill Gates, the billionaire-president of Microsoft has raised a donation of critical amount. In the lives of the institutions, the exposure to, and the dependence upon, the critical resources received from a single source is a risk factor in itself. There are not even discussions concerning the mechanisms of institutional fundraising. During an epidemic that is similar to ebola, the expert arriving from the northern hemisphere to the countries of the southern hemisphere was asked questions such as the following: What epidemic did you come to help with? Ebola? How many people die of it? 11 thousand? And of malaria? And how much do you care about the man dying of it? Or are you just worried about that the ebola will reach you by plane and will spread quickly? The questioner was not far from the truth. In our combat for the dominance of life on Earth collaboration for epidemic control and strategic thinking is carried out by isolated, financially vulnerable institutions and mission-oriented people and professional workshops. The answers currently available are unsatisfactory.

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József Bokor

An introduction to the examination of security issues in cyber-physical systems

József Bokor, full member of the Hungarian Academy of Sciences, Vice President of the Hungarian Academy of Sciences, Scientific Director of the Institute for Computer Science and Control of the Hungarian Academy of Sciences

Introductory thoughts concerning the subject of cybersecurity and cyber-physical systems

The virtual space – the so-called "cyberspace" –, made up of interconnected computer networks, has undergone an unprecedented expansion during the past decade. To an ever increasing extent, state and government bodies, companies and individuals require the ability to integrate the benefits of their online presence into their daily activities. The *World Wide Web (WWW)* has been the predominant technology for the past several decades to share electronic content around the world and retrieve it according to specific criteria. The enabler of leveraging the technology and making it accessible globally to everyone was made possible by the improvement of quality and reliability of the underlying technologies (e.g. network building and server technologies, virtual machines).

As the spatial expansion of cyberspace continues and the density of its supporting resource systems increases in the technologically advanced regions of the world, maintaining the reliability of services and the security of contents turned out to be the greatest challenge ever for the traditionally open and innovative digital technology, offering open access for everyone. At the same time, the advanced engineering systems of the future that emerged in the recent years are a product of a symbiotic approach to process control and informatics, creating a qualitatively new situation in the area of technologies previously described only as safety critical. Traditionally, safety critical systems are described as *standalone* engineering systems and applications the operation of which come with inherent risks of life threatening accidents and/or serious damages to the economy, the environment or even the society if they malfunction. Such systems include vehicle and aircraft control, applications in the chemical industry and in nuclear power plants, but also banking applications.

Cyber-physical systems are safety critical systems operating in the cyberspace: their physical implementation involves (embedded) computers, with a complicated network of connections between them, that collect data over various networks, monitor and control complex physical processes, manage sensors and actuators. The prevalent applications of

cyber-physical systems have a significant impact on our daily lives thanks to the exceptional degree of their adoption by the society: they can have a profound influence on our quality of life and on the efficiency of the contribution of industry, healthcare, education, and any other systems that are part of the private sector, and/or of an economic player to the national economy; they determine the state of the environment and the general conditions of community work. However, if they malfunction or if they deliver corrupted or maliciously altered content, these system may also be capable of causing accidents claiming human lives, service disruptions in entire regions, damages to properties, and environmental disasters, and as such they should be regarded as systems and technologies that have national security related implications, belonging to the critical infrastructure, and should be prioritized both in the design stage and in operation. For this reason, protecting the critical infrastructure has become a primary objective of modern societies. Technological progress comes with a number of benefits and opportunities, but it also carries new security risks and social challenges. Implementation and sustainable operation of cyber-physical systems introduce new challenges in terms of protecting the security of the cyberspace.

The *number of risk sources* or, in other words, the *threat* increases in proportion to, or – according to certain opinions – at a rate significantly exceeding the growth of the size of networks, which can be explained by the fact that the root causes of emergencies are mostly coded into the technological systems as structural sources of faults and failures. Operation in an incorrectly selected architecture carries structural risks. The *risk degree* has a distribution pattern that shows geographically varying densities, and is related to how advanced the local technology is. The fluctuations in the density distribution of services are characterized by the inherent proclivity of *large-scale* networks to form hubs as a result of their *(scale-free)* network organization and growth characteristics. Over the conventionally fault-tolerant, highly distributed connection systems of the Internet a highly vulnerable service delivery system built on centralized distribution/service hubs is formed, which increases the interdependence of system elements, and requires a system-level approach to the handling of vulnerabilities.

Reducing the openness of the system cannot be used to increase the security of cyber-physical systems as the operation of these systems rely on uninterrupted connectivity, which is characterized by a pool of redundant and highly distributed resources and cooperative task execution. One of the most important questions is how risks can be reduced by implementing security measures to block attempts at disabling or impairing technologies without restricting openness and accessibility that are regarded as essential in the context of those technologies and the society.

Preventive and countermeasures can be divided into two major groups. There are so-called *design-stage* considerations and there are *operational-stage* methods that can be applied to the operation of the rolled-out systems. For example, it is a design-stage consideration that the least vulnerable and self-repairing architectures should be created. When the architecture of cyber-physical systems with significant operational risks is designed, the security analysis, that is part of the design process, will involve maximizing the permissible statistical frequency (risk) of malfunction by a probability value proportional to the amount of damage caused, requiring that the probability of an unwanted event should never exceed this threshold.

In order to meet security requirements, the most critical cases may necessitate the use of fault tolerant solutions. Fault tolerance is the property of a system that allows it to restore its original functionality by recognizing anomalous changes in its operation (resulting from malicious interventions, tampering with data, component failures or any other external effects that have an impact of any kind on the integrity of the system). Fault tolerance, as a design property of the system, is an autonomous operational feature based on the detection of faults and failures and any other unwanted changes, aiming at restoring normal operation immediately.

Up until recently security issues of cyber-physical systems providing critical functionality were addressed typically in the area of network infrastructure protection and fault-tolerant control design. *Accuracy, integrity*, and *reliability* of data collected and processed by the system and their impact on security were given little though in the evaluation of risk factors. The status of sensors and actuators and their interaction with the environment containing the system were not a key part of investigations. This practice led to security solutions that assumed a closed cyberspace where the origin of faults and attacks was likely to be found inside the cyberspace (or, as a matter of fact, in the connection between computers). This approach is well characterized by the fact that, for example, while cryptographically encoded and authenticated *(digitally signed)* data traffic between communication end-points offers a solution for securing communication between two parties in a way that is literally unbreakable within a reasonable period of time and provides efficient defence against unauthorized injection of new data content between the two end-points, it is powerless against the malicious modification of transmitter-side sensor data (or the immediate physical environment of the sensor itself).

Thus, cyberspace should be regarded as an integrated whole containing sensors, actuators, information and network systems; a space with problems that cannot be resolved from the inside without taking into account processes in the environment encapsulating it. This way of looking at the problem may facilitate the handling of security risks in systems by correctly determining their vulnerability directions and treating their security risks as part of their environments, following a *systems theoretic* approach.

As a result, plausibility problems *(trusting)* that were brought up earlier in regard to the malicious tampering of measurement data and the reliability of sensors, should also be addressed as part of a new approach. For example, how can someone be sure that data entering the system provide an authentic representation of reality? Conventional error detection mechanisms of sensor systems which are based on testing the statistical independence of measurement data, are suitable for pinpointing physically damaged sensors or sensors that failed for any other reasons, and isolating data supplied by them. However, these methods cannot be applied to stop sophisticated attacks against the sensor space itself. In order to achieve this goal, new systems that are capable of verifying the plausibility of data must be used.

Through the application of the advanced methods of data science and machine learning, patterns, fingerprints, and regularities indicating normal operation can be extracted from the data entering the system, and then they can be used to detect anomalies. These topics are discussed in the first part of the study in which the author, András Benczúr, applies one of the most advanced methods of data science, the so-called *big data,* to the problem of input plausibility. In doing so, he elaborates the possibilities of the so-called data-driven

methodologies (methods using computer-based analysis and modelling of data) in the detection of security risks. Big Data based, typically real-time analytic processes, however, can only be implemented efficiently on an elastic IT infrastructure that offers versatility of access and support for custom configurations. The distributed method of data access, data sharing between the active elements of the system performing the analysis, and cooperative processing lay down the foundations of employing new plausibility checking methods based on the diversity of sources, and as a result, creating robust fault-tolerant systems. Design methods of this infrastructure *(IT cloud)* and the issues of implementing the Bid Data concept are addressed by Róbert Lovas in the second part of this chapter.

In cyber-physical systems, resolving input plausibility issues is a topic subject to real-time constraints. In such cases, control tasks should be taken over by efficiently distributed management and filtering strategies that are suitable for the architecture of the system. Environment perception methods for autonomous vehicles and vehicles systems, such as camera vision based methods, LIDAR (laser) based environment perception technologies, and complex shape, movement and human detection applications ensuring the accuracy of positioning and monitoring community spaces exposed to risks, represent serious scientific challenges in terms of compliance with security requirements. Such problems, including the capabilities and the applications of leading environment perception methods and a presentation of the typical signals and signal processing devices are discussed by Szirányi and Havasi in the third part of this chapter.

The automated transport systems of the future will form an emerging new class of critical infrastructures that, due to the overarching character of the transport sector within the national economy, play a fundamental role in ensuring the security of systems and processes affecting the entire society. Special applications of automated transport systems can be implemented in the domain of driverless ground and aerial vehicles. An overview of the research and development directions of controlling small flying objects that are usually not subject to a permit to fly (drones or UAVs) and the security aspects of integrating these vehicles into the air traffic control system is provided in the closing part of our chapter, by the authors József Bokor and Bálint Vanek.

András Benczúr

Data-driven Methodologies and Big Data

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Abstract

Traces of human activities, communication, travel, work can all be found in information systems. Data from these systems can be analyzed by machine learning tools that identify the patterns of normal behaviour and identify unusual or risky events from continuously produced streams of data.

In our study, we present the possibilities of data-driven Big Data analysis to detect security risks. Machine learning methods work proactively: instead of triggering the investigation by a certain event or query, all data are permanently monitored, with patterns and models continuously being applied to identify potential signs of risk.

During the over 20 years of their use, data mining methods have changed trends partly because new methods have appeared, and partly because knowledge from actual results have explosively increased. Early textbooks focused on clustering and association analysis, while currently new methods of classification such as boosting and deep learning are gaining ground.

Finally, we present the main quality of Big Data, which lies in the fact that traditional methods cannot cope with the computational requirements for data analysis. We introduce the Big Data phenomenon, the challenges and emerging answers. Recent, mostly open-source distributed software systems are capable of utilizing a large number of cheap commodity servers to implement complex data preparation and analysis tasks, which makes it possible, for example, to detect risk patterns in Web-scale social media streams.

Keywords: anomaly detection, Big Data, data mining, data-driven methodology, classification, data science, machine learning, models of security

Introduction

Most aspects of our daily life are already linked to information systems: almost all of the events of telecommunication, web, social media, transport, travel activities, and monetary transactions are recorded in the log files of servers, and in certain cases – for example, the

content of web and social media – they can be accessed by anyone. When we are looking for risks, we can obviously leverage all the data available to us. For example, we can link names in criminal records to those retrieved from social media, and we can map in this way the circumstances of known abuses, and we can extract the characteristics of the persons involved. In a similar way, we can launch an investigation based on public content discovered on the web when we need to find the actual persons behind some content that poses a risk. However, we can also look at the data as a whole in which known persons, suspicious content and relationships can be transformed into attributes and huge tables that contain quantitative information and can be used for model building, allowing us to look for known or yet to be discovered risk patterns.

The key characteristic of data-driven surveillance is that it is proactive instead of being triggered by an event. A machine learning process will assign a risk classification to all events arising in the system, contrary to search-based surveillance that operates by retrieving the environment and the characteristics of specific events and persons, looking for similar objects. When searching, we will probably identify the patterns only in a very small portion of the data. Currently, the most widely accepted name for the discipline that develops predictive models based on available data is data science.

Certain predictive modeling methods, such as the decision tree (Safavian et al., 1998) or logistic regression (Cox, 1958) have been used in statistical analysis for more than fifty years. The phrase *"data mining"* emerged in the middle of the 1990s to identify the discipline that puts emphasis on the issues of size and efficiency in data analysis (Han et al., 2001). One of the first innovations of data mining was associative analysis, which, however, along with a few other methods, proved to be of limited use in practice.

Today data science primarily focuses on the processing and cleansing of huge data volumes, the generation of attributes, followed by the learning of the attributes of individual data points. It employs new methods, such as deep learning which has recently become computationally feasible with the improvement of the algorithms for training large neural networks, or the so-called boosting procedures that have extremely beneficial properties for practical applications. About ten years ago it was mostly the explosive growth of web-based data volumes that drove the emergence of *big data* as a distinct discipline, which has become more of an interdisciplinary field supporting data science and offering recommendations for solutions to special data volume related issues. The most important tools of big data are open source software applications like Hadoop (White, 2012), Spark (Zaharia, 2010) or Flink (Carbone at al., 2015), all engineered by Apache Software Foundation.

This study is intended to describe how data science methodologies can be used to discover security risks. We will also give an overview of the methods that are an integral part of data science and incorporate practical experience and new scientific advances starting with the first procedures that have been in use for more than fifty years. First we will introduce the two major types of security systems – the positive and negative model – that are capable of recognizing risks and we will examine their advantages and shortcomings. In the next subsection, the principles of data-driven methodology and the methodology of providing training and evaluation test data will be described. It will be followed by a discussion of the new trends in machine learning, the factors behind the changes, and the features of the new methods that are most important in applications. Finally, we will examine the phenomenon of big data and touch upon the methods of analyzing, for example, the data deluge pouring from the social media to recognize risk factors.

Security models

The significance of risk models lies in the fact that they describe potential behaviour patterns that we wish to identify and select from a set of possible events to conduct an investigation or to take preventive action. The concept of risk models originated from the network security field of information technology (Bertino et al., 1997), but obviously it is also present in any other types of security systems. The first risk models were based on positive authorization patterns that were later supplemented with negative and mixed rules (Bertino et al., 1997) (See Figure 1). Next follows the explanation of the essential differences between the two types of models in terms of their potential applications as well as their relationship to machine learning methodologies, and we will also address the possible ways to move forward and combine the best of both worlds.

This paper will focus on machine learning mechanisms implementing the negative security model. We find it very important to explore the extra capabilities of the positive model and the alternative methods that can be used to extend typical negative models.

Negative security model

A negative security model built of past security events that represented threats can only detect security events that have a precedent. This solution is quite efficient if the number of detected security events is significant and their characteristics do not change over time, which makes these systems better suited for catching credit card fraud than detecting acts of terrorism.

Positive security model

We seldom encounter positive security model based solutions, especially one that can handle data from the transactions, the computer network and the physical sensor network in a standardized way. A key part of the possible solutions is to analyze hidden relations in the data, for example by finding identical attributes between different entities (e.g. the same home address shared by "different" clients).

Further directions

In the past ten years, machine learning applications have mainly focused on supervised models. This means that current systems are mostly based on the negative security model where some anomalous events had to be detected and logged previously in order to train the system. Use of the positive security model may be enabled, for example, by the so-called active learning methodology (Tong et al., 2001), where the system constantly requests expert feedback about events it is uncertain how to classify. In this way human collaboration makes it possible to investigate cases suggested by the machine, leading to the formulation of a model tweaked for more accurate automated recognition.

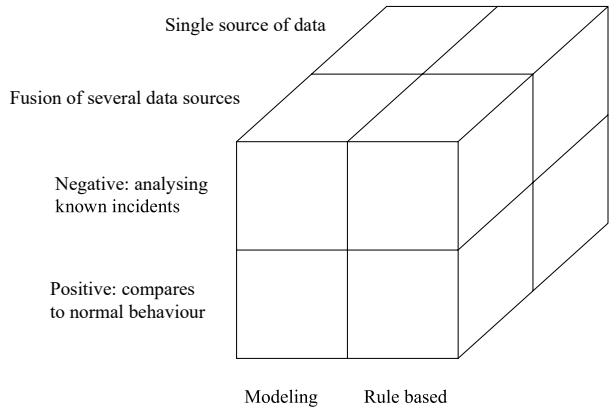

Figure 1

Security models

Source: The author's own contribution

Figure 1 shows the central point of the data-driven methodology in a three-dimensional spatial diagram of the security models. Contrary to rule-based systems that require tremendous manual work, data driven methods learn patterns from the data. While most of the conventional systems check data sources one by one, data driven methods can model the joint behaviour of several data sources.

Data science and data-driven methodology

The data-driven methodology draws conclusions by processing and analysing all available data, and by using qualitative methods. The possible methods can parse huge amounts of various types of data (text, physical measurements, data traffic, date, period, monetary amount or category). Operation of data-driven systems is shown in Figure 2. After cleansing the data and converting them to a uniform format, classical or more recent data mining and machine learning algorithms are used to create patterns, signatures, extracts, profiles and aggregates for further analysis and modelling.

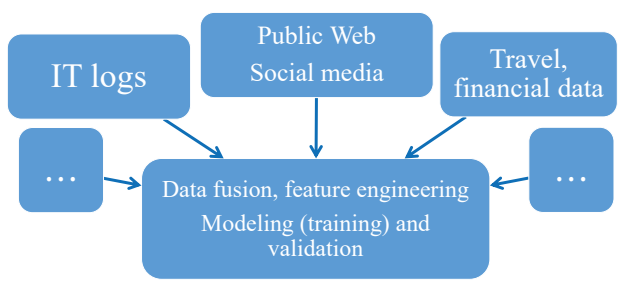

Figure 2

Central data fusion phase of the data-drive platform

Source: The author's own contribution

In the phase of generating the attributes, we need to select the base object of prediction, which can be a person, an IT system event, or a financial transaction. Available data about the base objects should be transformed to produce an array of attributes associated with the objects as rows. Figure 3 shows numeric and categorical values. Figure 4 shows a table consisting of text data.

ID	Activity Month 1	Activity Month 2	Activity Month 3	Travel to monitored target location	Risk at place of stay	Distance in network from suspects	Physical distance from suspects	…	Risk (label)	M1 (logistic regression)	M2 (depth 2 tree)	M3 (boosted tree)
1	1000	1100	1200	0	0.2	…	…	…	no	0.17	no	3
2	1000	1200	1100	1	0.5	…	…	…	yes	0.49	no	-1
3	2000	3100	3200	1	0.1	…	…	…	no	0	no	1
4	2000	2200	2100	0	0.3	…	…	…	no	0.39	no	3
5	3000	3100	3200	2	0.6	…	…	…	yes	0.84	yes	-3
6	3000	3200	3100	0	0.5	…	…	…	no	0.54	no	1
7	3000	4100	4200	1	0.2	…	…	…	no	0	no	1
8	3000	3200	3100	3	0.3	…	…	…	yes	0.96	yes	-1
9	4000	5200	5100	0	0.3	…	…	…	no	0	no	3
10	4000	4200	4100	0	0.7	…	…	…	yes	0.69	yes	-1

Figure 3

Sample data of ten suspected persons, with numerical attributes

Source: The author's own contribution

(1) John likes to watch movies. Mary likes movies too.
(2) John also likes to watch football games.

List of words: "John," "likes," "to," "watch," "movies," "also," "football," "games," "Mary," "too".

Word bag representation: (1) [1, 2, 1, 1, 2, 0, 0, 0, 1, 1]
(2) [1, 1, 1, 1, 0, 1, 1, 1, 0, 0]

Figure 4

A set of text data examples and their bag of words representation

Source: https://en.wikipedia.org/wiki/Bag-of-words_model

The output of data-drive methodologies is the prediction associated with the individual objects that can be binary (yes/no), a risk probability, or an estimated risk value. We can measure the performance of the system either by new events entering the system or by using the test data set compiled during model building. We will explain the training and validation options and certain evaluation metrics below.

When training the model, we need to compile information from previous events and use them as *training data* for building our model. The completed model can be applied to

making predictions based on the constant influx of new so-called *test data* or the *validation data* that was set aside at the time of building the model. Test data can be selected from what is the future relative to the moment of building the models, or by sampling the available data. Cross validation is a frequently employed method where objects are randomly divided into several groups, and then one of these groups is selected in every possible way as a validation set to calculate the average performance of the produced models. Measuring model performance on training data is not recommended because we will overestimate the quality. We may also overfit the model, which means that there is an alternative model that underperforms on the training data, but outperforms the original model when it is applied to the test or validation data set. Overfitting restricts our ability to generalize the model to unknown cases. The possible training and validation methods are summarized for example by Tan (2013, Section 4.5).

Finally, there are two options to quantify the quality of predictions. If the method in question produces a binary (yes/no) risk forecast, the quality can be derived by reviewing the so-called class confusion matrix (Power, 2011). The four elements of the matrix (as shown in Figure 55): the numbers of true positive (TP), true negative (TN), false positive (FP), and false negative (FN) events.

	Actual risk: YES (positive)	**Actual risk: NO (negative)**
Classified as risk by M1: YES (positive)	True Positive (TP) 3 (ID 5, 8, 10)	False Positive (FP) 1 (ID 6)
Classified as risk by M1: NO (negative)	False negative (FN): 1 (ID 2)	True Negative (TN): 5 (ID 1, 3, 4, 7, 9)

Figure 5

Confusion matrix for risk prediction for threshold value M1 > 0,5 of model M1 in Figure 3 Accuracy in the example: (3 + 5)/10 = 80%; precision: 3/(3+1) = 0.75; recall: 3/(3+1) = 0.75; false positive rate: 1/(1 + 5) = 0.16.

Source: The author's own contribution

From the confusion matrix, the following values can be derived:

- accuracy: (TP + TN)/total number of cases,
- precision: TP/(TP + FP),
- recall or true positive rate: TP/(TP + FN),
- false positive rate: FP/(FP + TN).

If we examine a model that assigns risk probabilities to the individual incidents, then additional quality measurement options will be available. We can obviously create a confusion matrix for any risk thresholds: entries below the threshold will have a negative, those above the threshold will have a positive classification. We will get a more stable measure, however, if we manage to evaluate the prediction independent of the threshold value.

The so-called *ROC (Receiver Operating Characteristic)* curve (Swets, 1996) plots the true positive rate for the possible threshold values in related to the false negative rate (Figure 6). The area under the curve is called *AUC (Area Under the ROC Curve),* which is a value between 0 and 1. The AUC value determines the probability that a random positive

event is ranked higher than a random negative event by the model. AUC = 1 indicates perfect prediction, while AUC = 0.5 means that the model is guessing randomly. If the AUC values are below 0.5, we will get better results by inverting the output of the model. As a result, we can work with the Gini = 2 × AUC – 1 value.

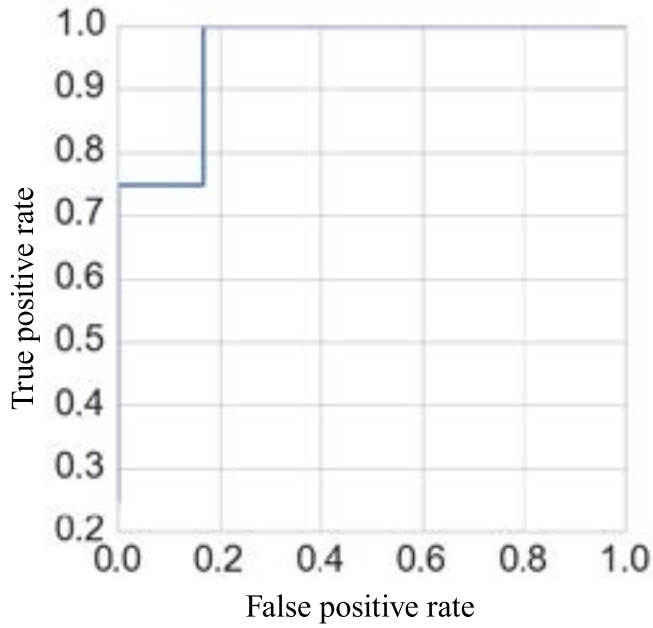

Figure 6

AUC curve for prediction M1 in the example of Figure 3

Source: The author's own contribution

Supervised and unsupervised learning

Supervised learning relies on training data labelled by an expert or as a result of some process. Supervised machine learning is best suited for implementing negative security models as it relies on known risk events. The unsupervised methods do not require the manual labeling of data, and as such they are perfectly suited for positive security models in theory. However, the practice of machine learning shows that it is very hard to use supervised learning in real-world environments as it is difficult to evaluate the quality of the methods and interpret the results.

In this subsection, we will introduce the most important supervised classification, regression and anomaly detection methods, and we will also describe the limitations of the popular (unsupervised) clustering approach. We will not discuss frequent pattern and association rule mining, the earliest methods of data mining, as they did not prove to be useful in practice.

Supervised learning progressed considerably in the past twenty years. The earliest methods, such as decision tree (Safavian et al., 1998) or logistic regression (Cox, 1958), was followed first by *SVM (Support Vector Machines)*, which, for example, is excellent for classifying text entries (Joachims, 1998). Boosting-based methods (Freund–Schapire, 1997) are usually included in the solutions at most of the data analysis contests (Chen et al., 2016). The scope of application for deep learning (Lechun et al., 2015) has been expanding continuously beyond its original use, classification of images and videos.

In order to look for anomalies, most of the supervised classifiers can be transformed into a single-class version that receives only the elements of one of the classes (that represents normal behaviour) during the training. Anomaly detection, however, is characterized by the general issues of unsupervised methods: evaluation and interpretation are typically difficult. Very often, for example, we may find vast amounts of anomalous events that are not relevant in terms of security.

Classification

A prerequisite of classification is that events should be labelled automatically or through human intervention into classes. Classification is based on the negative security model in the first place, but it can also learn the patterns of normal operation. In the history of classification, after the initial methods (decision trees, logistic regression) there were quite a few paradigm changes which we will describe briefly in the following section along with an overview of the key methods.

Conventional methods

Next, we will explain the key principles of "conventional" classification methods already used before the millennium.

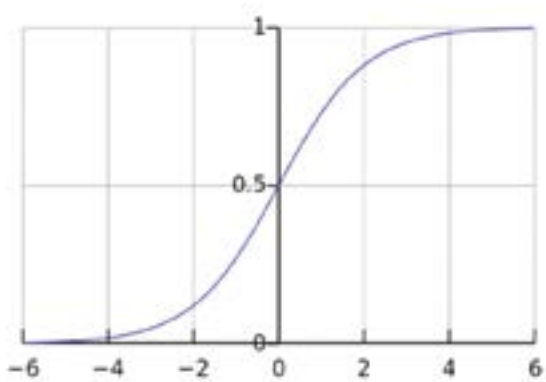

Figure 7
The form of the expit or logistic function

Source: https://en.wikipedia.org/wiki/Logistic_function

The input of *logistic regression* (Cox, 1958) consists of numerical variables. We learn the weight of each variable to calculate the weighted sum of each event. Above a threshold value a positive classification (risky) and below the threshold a negative classification is assigned to the given incident. When applied to the data set in Figure 3, the following formula will produce a 100% accurate model

score = expit (– 0.2 × Travel – 0.8 × Location + 0.5)

where the plot of expit or logistic function $\frac{1}{1+e^{-x}}$ is shown in Figure 7.

Logistic regression tends to overfit to strongly correlated variables. For example, the following formula obtained through actual training

score = expit (–0.0136 × Activity1 + 0.004 × Activity2 + 0.009 × Activity3
–1.0 × Travel –0.15 × Location)

reaches an accuracy of only 60%.

The name of the method is related to the use of the logistic function. The logistic function transforms the weighted sum of variables into a value between +1 and -1, and so it can assign a risk probability to every incident. The prediction that belongs to the first model in the example that uses only the Travel and Location variables is shown on the left side of Figure 8. The distribution of risk probabilities is shown on the right side. It is important to know that the threshold value applied to the weighted sum of the variables will always produce a high-dimensional linear separation of the data points similar to that on the left side of Figure 8, and thus it is not capable of recognising classes delimited by curves. This limitation will be overcome by the SVM method that we will describe in the following subsection.

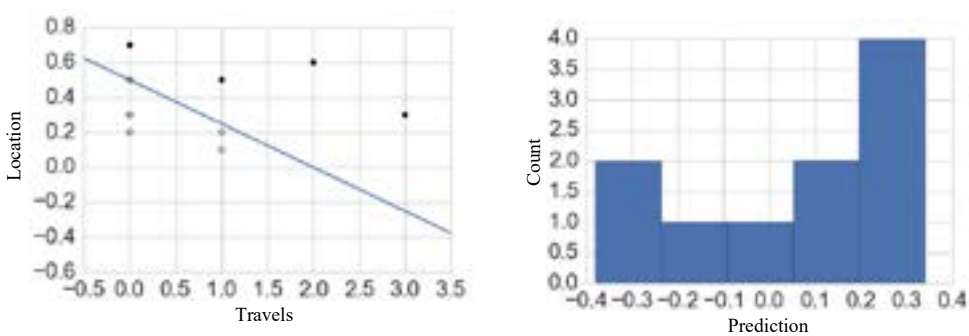

Figure 8

Logistic regression of data in Figure 3

On the left: separation of cases according to the model containing the Travel and Location variables On the right: distribution of risk probabilities produced by the model

Source: The author's own contribution

Logistic regression is very popular today. For example, in the financial sector it is a competitive modelling procedure typically used for making crediting-related predictions.

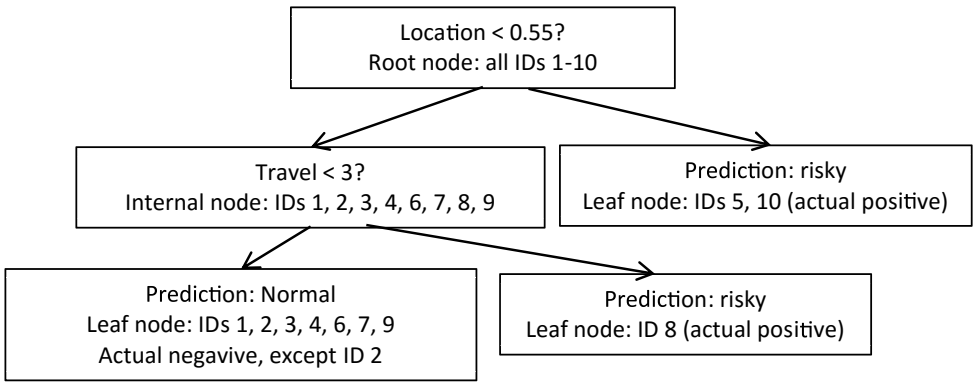

Figure 9

Depth two decision tree for the data in Figure 3

Source: The author's own contribution

As shown in Figure 9, *decision trees* (Safavian et al., 1998) split data points progressing from the root node (which is positioned at their upper end) by selecting variables with threshold values. As we proceed from top to bottom, we keep splitting the data set. While training the model, we need to find the decision that separates the two classes as much as possible in order to split the data points. If the quality of split is not satisfactory or we think the tree is too deep, we stop and construct a leaf node where the data points assigned to the leaf will determine the output decision as their majority class. Decision trees are popular due to the fact that the model is easy to interpret. Their quality, however, is lower than that of other methods. The renaissance of decision trees was brought about by the boosting methodology we will describe later, which can create high quality models built on decision trees.

Bayesian models (Gelman et al., 1995) are created by examining the distribution of the single variables or variable groups (V) by each class (O) in the training data as a function of the variable values. Using the concepts of probability theory, we observe the conditional distribution P (V|O). Classification of a data point with an unknown value V = v is obtained by finding the maximum of the following formula for O, based on Bayes' theorem:

$$P\,(O|V = v) = \frac{(P(V = v|O)P(O)}{(P(V = v)}$$

The concept of *artificial neural networks* (Haykin, 1998) originates from the efforts to model the operation of the human brain. We can regard a neuron as a logistic regression model that produces the weighted aggregate signal received through their nerve-endings and activates output nerve-endings by applying the logistic activation function shown in Figure 7. An artificial neural network is formed by connecting nerve-endings to other neurons where certain neurons will receive input data while another group will provide output data according to Figure 10.

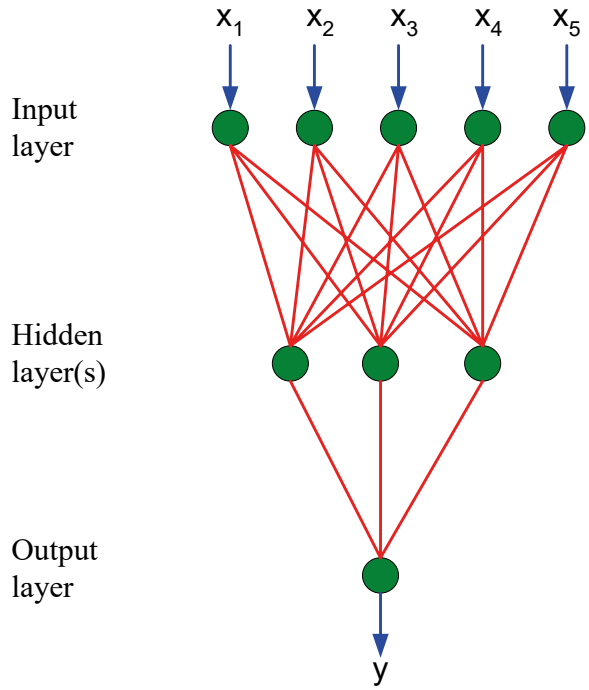

Figure 10
Artificial neural network

Source: The author's own contribution

Artificial neural networks have been used for a long time with moderate success for a wide variety of classification tasks. Today the growth of computing capacities allows for training very large networks (the so-called *deep* networks). Later we will explain the principle of deep learning and the options for its application.

Kernel methods and text mining

The SVM *(support vector machine)* (Vapnik, 1995) method can transform a model that resembles regression and separates data points linearly (see Figure 8) into a model of non-linear classes, such as classes delimited by curves. The key idea behind this model is to transform data to a higher dimensional space by using so-called kernel functions. As shown in Figure 11, a data set that cannot be split in a single dimension can be split into two parts with a line, which can be achieved by applying the kernel function.

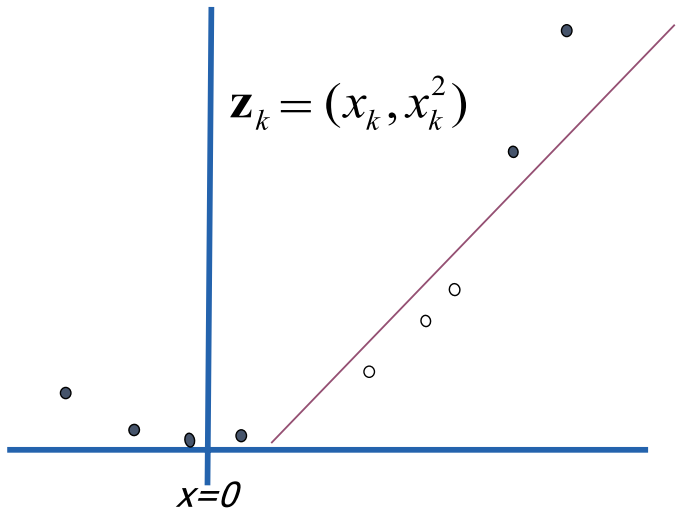

Figure 11

Linear separation by mapping to a higher dimensional space

Source: The author's own contribution

SVM can be used very successfully to classify text data (Joachims, 1998; Tong–Coller, 2001). A proven method of analyzing text is to use the so-called "bag-of-words model", which describes the properties of single documents with the number of words in them or with variables derived from the weighted and transformed versions of those figures (see Figure 4). For bag-of-word data, SVM usually provides high quality classification results. A recent area of application for SVM is the classification of time series. For time series, similarity measures are often difficult to manage mathematically and cannot be directly combined with other variables. The so-called similarity kernel methods, however, can be used to map time series to a space shared with other data types (Daróczy et al., 2015).

Boosting

Boosting is perhaps the most successful and widely usable method of supervised classification (Chen et al., 2016). Its basic principle is the constant correction of the results from very simple classifiers by training more and more simple classifiers that eliminate the errors made by the previous set of classifiers. Its most successful implementations are AdaBoost (Freund–Schapire, 1997), LogitBoost (Friedman et al., 2000) and GBT *(Gradient Boosted Tree)* (Friedman, 2001). Boosting methods typically rely on small-size decision trees that may consist of as few as a single decision or a limited number of levels (two to four) as simple classifiers. A possible instance of the model that corrects the first decision tree with a second tree in the next iteration is shown in Figure 12. An advantage of the model produced by combining two decision trees is that the second tree can be trained by using the entire set of data compared to the single large tree, where the deeper branches may have been determined by using a very small subset of the data points.

```
Tree #1
    if Travels < 1:
        score = -1
    else:
        score = 1
Tree #2
    if Location < 0.4:
        score = score - 1
    else:
        score = score + 1
Tree #3
    if Travels < 2:
        score = score - 1
    else:
        score = score + 1
```

Figure 12
A GBT example using data from Figure 3

Source: The author's own contribution

Deep learning and image classification

Deep learning means training a neural network consisting of a very large number of neurons. Neurons are often interconnected in layers modelling human vision, such as the convolutional network that is capable of recognizing edges in an image or the max pooling network that changes resolution and proceeds from the smaller units towards bigger ones (Figure 13). Deep learning is very successful in recognising images (Krizhevsky et al., 2012) and sounds (Lee et al., 2009) and in resolving special word processing tasks (Ronan–Weston, 2008). Its most recent areas of application includes recommender systems (Wang et al., 2015).

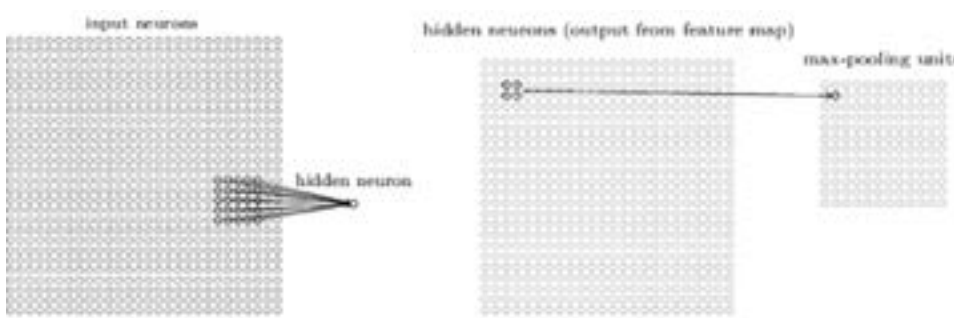

Figure 13
Building blocks of artificial neural networks
On the left: convolutional neuron. On the right: Max-pooling neuron

Source: Teterwak (2015)

Regression

Regression is also part of the supervised learning methodology. Unlike classification, instead of separating positive and negative events, it is numerical values such as risk levels or the extent of damage caused that must be predicted. Most of the classification methods have a regression counterpart, such as the *support vector* regression (Basak et al., 2007). We will explain two basic methods below. The earliest version of the regression method is linear regression that, much like logistic regression (which, contrary to its name, is not a regression but a classification method), produces output values as a weighted aggregate of the variables. Regression trees can be constructed if we assign to the levels of decision trees a continuous numeric value, calculated as the average of data point values associated with that level, instead of a class designation. The boosting method presented in Figure 12 is actually made up of regression trees as we assigned numeric values to the levels.

Clustering

Clustering is a popular tool for unsupervised learning; its similar or synonymous names are segmentation, unsupervised classification, or grouping. This method can be efficiently used for presenting and visualizing small sets of data, and for this reason it is popular in the field of social sciences (Newman, 2001) and in the study of biological systems (Barabasi–Oltvai, 2004). The simplest method of clustering is the k-means algorithm that repeatedly assigns data points to *k* clusters, initially selected at random until they create good separation of the data points (Ball–Hall, 1965). There are a huge number of other known methods, which are summarized, for example, in Jain (2010). In a big data environment, clustering can deliver results that are relatively difficult to interpret and verify as very strongly associated events dominate the entire system. Typically data points are clustered around the centre and the easy-to-interpret groups make up only a negligible part of the data set (Kurucz–Benczúr, 2010) as shown in the examples of Figure 14.

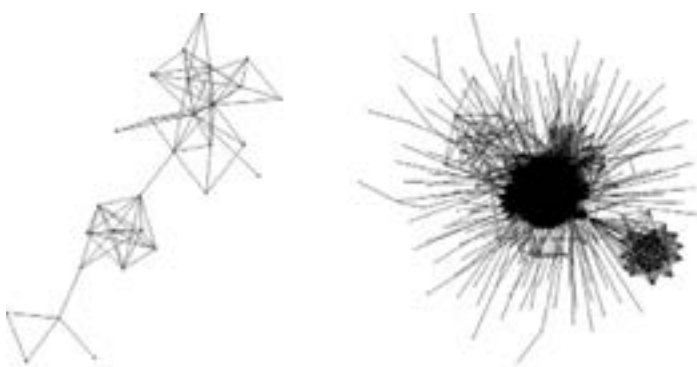

Figure 14

Typical substructures in a very large network: a small number of densely connected vertices that are linked loosely to each other with long appendages.

Source: Subgraphs of Livejournal with 29 and 317 vertices (Kurucz–Benczúr, 2010)

Anomaly detection

Recognition of anomalies (Patcha–Park, 2007) appears to be a very promising method that seems to be very useful for practical applications at first glance. In real cases, however, the fact that recognized anomalies do not necessarily pose a risk is often a problem. If the methods have no access to external knowledge, they can identify as an anomaly all human actions performed only by few people, generating a lot of false alerts. Adding external knowledge often means that an originally unsupervised task is turned into a supervised one, which involves adding labels to known incidents. Two popular methods of detecting anomalies is to check distributions to filter out statistically extreme values and to use classifiers to build a model that fits normal behaviour the best. An example of the latter is the one-class SVM (Manevitz–Yousef, 2001) or the generation and separation of artificial data from normal patterns.

Methods of network science

Network science (Lewis, 2011) is a relatively young field that specializes in the study of the structure, formation, and stability of linked events. In the context of security and risks, persons who are connected with each other, either in real life or virtually on community portals or who are found at the same location and communicate with each other, persons entering into a contractual relationship, or members of organizations and hierarchies can form a network. Visualization of networks will reveal the system of connections between cooperating groups and events, as shown in Figure 15. Network connections can be described using various distance measures. Such terms may include the least number of connections through which a party can contact the other, or the number of common interactions. Complex metrics such as Google PageRank (Brin–Page, 2012) characterizing centrality or SimRank (Jeh–Widom, 2002) measuring similarity are based on the length of random walks within the network.

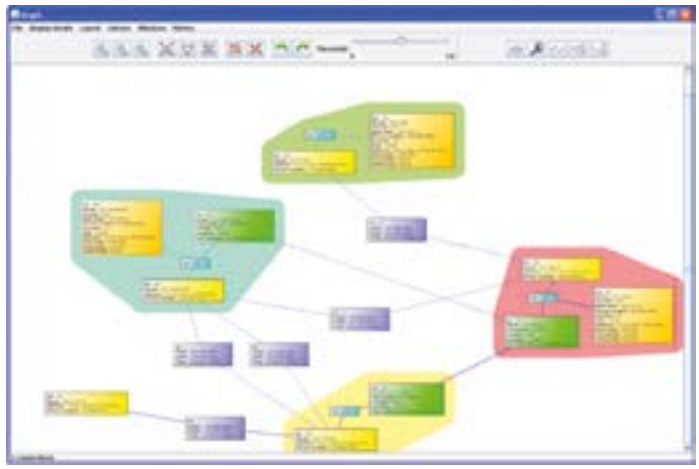

Figure 15
A screenshot of a device providing assistance in the fight against organized crime, displaying network connections

Source: MTA SZTAKI

Challenges of big data

In the past years launching big data projects has become a fashionable trend in all areas of application. This subsection of our study will present examples of the big data phenomenon, and we will attempt to debunk a few misconceptions. Real Big Data tasks are rarely found, Big Data is an exception rather than the rule. Such exceptional cases include web content, social media, and mobile network traffic. Installation of a large number of sensors, for example, in urban or manufacturing plant environments may also generate huge amounts of data, but such sensor networks are not yet widespread. Processing video streams requires special, mostly graphics processing unit (GPU)-based powerful pre-processing and information extraction capabilities and constitute a distinct field of application.

The three "V" – volume, velocity, and variety

Big Data implies tasks that cannot be completed at all with conventional software tools (database management systems, office applications, desktop servers). The most important characteristic of Big Data is that it requires the coordinated computing capacity of a large number of servers, using special software tools. It is surprising that Big Data problems arose while computing capacities were growing. We will use examples to show that data volumes increased at the same pace as the computational capacities. As a result, algorithms that do not scale linearly with the amount of data became more difficult to handle than before. One of the simplest, most basic routine task that does not scale linearly is sorting: it is no wonder that system developers demonstrate the capabilities of their devices by sorting terabytes and then petabytes of data.

Big Data, however, is more than the size of data. Its three key features are as follows:

1. *Volume:* the amount of data, which, in itself, is considered a Big Data sized task if it is in the order of petabytes.
2. *Velocity:* the rate of data influx. Secondary storage devices are often too slow to store the data, which prevents the recording of the entire data content, or the single incidents require too fast a response, for example, in road traffic situation.
3. *Variety:* it greatly increases data processing costs if data is heterogeneous and unstructured, and contains noise or errors. An example is extraction of persons and relations from unstructured text, and recognition of events using camera data.

Quick, cheap, and high quality

In everyday life we usually learn that tasks can seldom be completed quickly, cheaply, and to high standards. Out of the three conditions, two are usually satisfied, but unfortunately the three are almost never. In the case of Big Data systems, the above observation is surprisingly reinforced by a mathematical fact, the famous Fox–Brewer theorem (CAP theorem) (Gilbert–Lynch, 2012). We will describe the theorem and its consequences below.

In the case of IT systems, speed refers to response times, while quality means the accuracy of the received answers. Cheapness corresponds to a much less natural concept called "partitionability". It is very expensive to add large amounts of memory and a high-capacity mass storage device to a single processing server, and after a while costs will rise sharply, thus limiting usability. A cheap solution is that the required computing resources are partitioned over a large number of inexpensive servers that perform distributed computations communicated through the network.

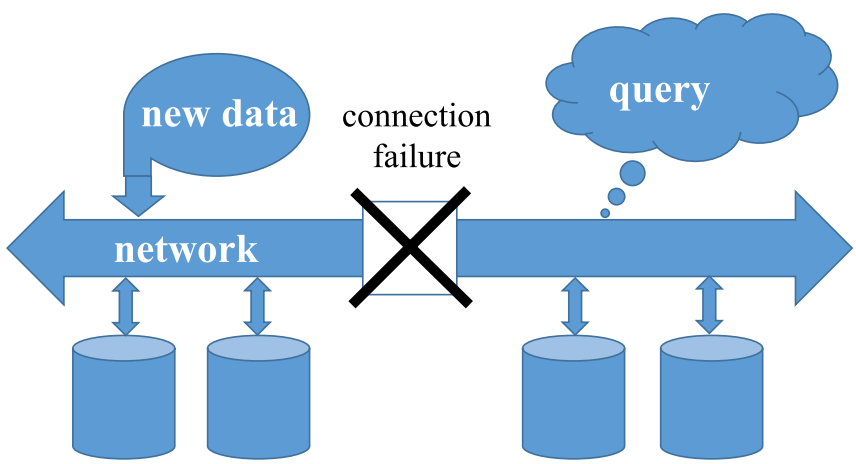

Figure 16

An illustration of the Fox-Brewer theorem

Source: The author's own contribution

The Fox–Brewer theorem states that there is no distributed system (cheapness) that can provide both instant responses (speed) and assuredly correct responses (quality). Below we will describe the very simple proof provided by Gilbert and Lynch (2012). Let us assume that our system is partitioned and responds instantly. In such a case, as shown in Figure 16, it may occur that the system is split into two parts due to a network connection failure. If the left side in the figure receives new data, the right side will not be able to answer even the simplest questions, for example, about the number of records until the network connection is restored.

Let us examine what options are allowed by the Fox–Brewer theorem. We can have a fast and correct solution. Such solutions include conventional single-server systems where data is stored and directly accessed in the memory. The bigger the systems are, the faster the costs of these solutions grow – typically a single server will not be able to accommodate the required amount of memory or occasionally the disk capacity.

We can have a partitioned and correct solution. If the connection to a processing unit is lost, such a system will indicate the failure and attempt to rebuild the data from, for example, redundant server backups. The system will not respond until all failures are eliminated so it will not be fast in every case. We can have a fast and partitioned solution. If a fault or failure occurs, such a system will regard inaccessible data elements as if they did not exist, and will respond to queries without taking those elements into account. The answer will not be correct, but it will at least approximate the correct answer. Once those faults or failures are eliminated, these systems can synchronize missing data and achieve correctness in time.

NoSQL repositories

Database management usually means systems that provide fast and correct answers. Based on what we have so far discussed, we may encounter serious problems when database management systems outgrow servers even with the largest available capacity, and we need to migrate to a distributed system of several smaller servers. A number of open source systems have been released that offer partial support for SQL database queries and are capable of storing data distributed on several servers. Such systems are commonly called NoSQL (Cattel, 2011), which, in the first place, refers to the fact that certain operations are either not supported or only supported by alternate distributed operations. Most often the table joint operation is missing, which would require moving the data of several servers of the distributed data storage. NoSQL is frequently called Not-Only-SQL, but in reality the capabilities of the query language are almost always restricted.

The simplest NoSQL systems are the so-called key-value stores (DeCandia et al., 2007). Next, we will touch upon the most important systems and the principle of *consistent hashing* on which most of these systems are based. The objective of key-value stores is to support the capability of inserting new data by distributing huge volumes of data on several servers, and retrieving them on the basis of keys. The difficulty lies in the fact that in order to prepare for occasional server outage, data should be stored in a redundant way, and we will need to find the server containing the given key even if the primary server is unavailable due to failures.

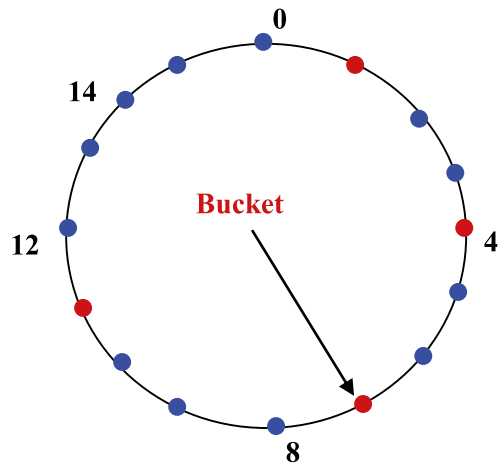

Figure 17
The principle of consistent hashing

Source: The author's own contribution

The basic idea behind key-value stores is the so-called consistent hashing technique (Karger et al., 1997), which is illustrated in Figure 17. Both the keys and the storage servers are mapped to the unit circle. Every key is assigned to some of the closest servers clockwise. In this way we do not need to determine either the number of servers or the number of possible keys in advance. Uniform random mapping ensures that keys are evenly distributed among the servers even if the number of servers changes constantly due to units dropping out of service and replacement servers being started up.

MapReduce paradigm and more

The MapReduce paradigm was introduced by Google (Dean–Ghemawat, 2008), mostly to support building large search indexes. Later they tried to apply it to almost all Big Data solutions, and its open source version called Hadoop (White, 2012) has also been released. MapReduce is a special distributed execution schedule that can be used to implement parallelized tasks on a large number of servers. The general principle is illustrated in Figure 18. The input data of MapReduce – in this case, a big text file – is shown on the left side. In the distributed system, the data is already partitioned across servers. In the first "Map" phase, the elements of the partition are processed one by one, which means counting the number of words in them in this case. Then the result set (word, count) is broken down into pairs and sorted by using "word" as a key. The "Reduce" phase receives values associated with a single key so that the server may count its occurrences in a subset of words.

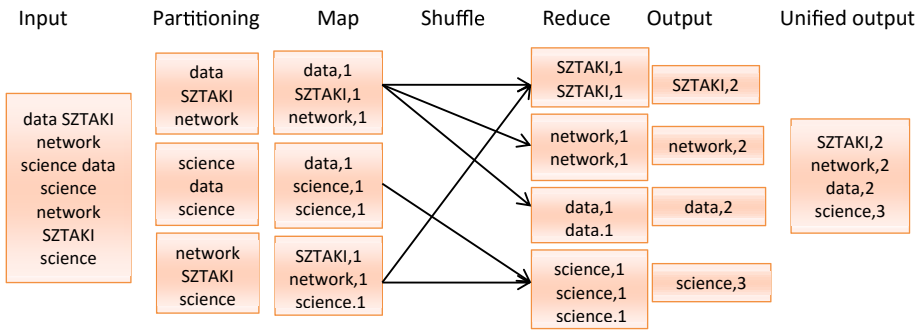

Figure 18

MapReduce example – counting word occurrences

Source: The author's own contribution

MapReduce systems are partitioned and provide correct answers. Correctness is ensured by repeating the individual Map and Reduce steps, possibly after moving them to a server, until successful execution is verified. However, this is exactly their most severe limitation: they are unable to respond quickly. The emergence of the MapReduce paradigm and the open source Hadoop system was a key step towards, among other things, reducing the costs of processing huge volumes of web documents, and making them available to analysts, companies, and authorities. However, MapReduce is no "super weapon," as implementation of complex tasks over big data may be hindered by serious limitations. New approaches requiring a different principle of processing include data stream system, machine learning, and processing of network structures. There are two emerging open source systems that target the above mentioned areas: Apache Spark (Zaharia et al., 2010) and Apache Flink (Carbone et al., 2015).

Summary

This part of our study summarizes applicable data based risk prediction methodologies, the key steps of preparing data and building and evaluating models. Several machine learning techniques offering high quality solutions to supervised learning in the first place were shown. The universal principle of economics – "there is no free lunch" – also emerges in the field of risk predictions: in general, anomaly detection systems that do not require external intervention and perform unsupervised classification do not prove successful in practice. We also emphasized the significance of human labelling, incident investigation and generation of training patterns in machine learning based risk detection. We showed that many data sources available to risk detection fall within the Big Data category, which means that they cannot be processed and analyzed using conventional software solutions. In order to tackle Big Data tasks, we also explored available, mostly open source systems, including their capabilities and limitations.

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Róbert Lovas

Application of Cloud Computing Based Platforms for Environmental and Societal Security

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Abstract

Environmental and societal security are two important areas in the generic topic of security issues. Numerous IT research and development achievements can provide efficient support and toolset for security experts to prevent, detect and handle the various effects of security challenges. The sufficient quantity and quality of available data is vital for the successful application of those IT solutions. The widely spreading sensor networks, social networks, and digital repositories allow us to access an extremely large amount of data through communication networks, and their volume is growing exponentially. Moreover, a significant part of this data is publicly available. On the other hand, there is a need for elastic, highly scalable e-infrastructures that can be built from mostly existing software and hardware components on demand to perform computational or data intensive analytics, simulations and predictive algorithms as fast as possible by the expert.

This paper presents some features and emerging trends of e-infrastructures and software tools based on the above requirements, which are capable of collecting and processing (open) data e.g. NoSQL database technologies, cloud computing, workflow-based and so-called orchestrator software tools.

Certain strongly related domestic, large-scale research and development projects are also discussed for illustration purposes as well as for reference, in which the Institute for Computer Science, Hungarian Academy of Sciences played a key role in the last decade. For example, the Agrodat.hu project is briefly described, aiming to process large quantity of monitored environmental parameters, images, non-structured documents (e.g. open social network data sources). The results of the Agrodat.hu projects are strongly interconnected with environmental and societal issues, or can easily be adopted.

Keywords: cloud computing, sensor data, unstructured data, IT platform, automatic deployment, scaling, workflow, Big Data, security, open source

Introduction: aspects of environmental and societal security involving electronic infrastructure

Environmental and societal security are two important areas in the generic topic of security issues that have a profound impact on citizens' daily lives and their standard of living. For example, if environmental security is reduced, regional or even global food shortages may occur. Reduced societal security often leads to the formation of parallel societies, which may cause problems in all aspects of the population's daily lives.

Numerous IT research and development achievements can provide efficient support and toolset for the security experts to prevent, detect, and handle the various effects of security challenges. The sufficient quantity and quality of available *data* is vital for the successful application of those IT solutions. The widely spreading sensor networks, social networks, and digital repositories allow us to access extremely large amount of data through communication networks, and their volume is growing exponentially, and a significant part of these data is public. On the other hand, there is need for flexible, highly scalable *e-infrastructures* that can be built from mostly existing software and hardware components on demand to allow experts to perform computational or data intensive analyses, simulations and predictive algorithms as quickly as possible.

In the following we will describe the characteristics and key trends of future-proof information technology infrastructures and software tools that satisfy the above requirements and are needed for the collection and processing of (public) data, and, by way of illustration and reference, a few closely related large-scale research and development projects of domestic relevance in which the Institute for Computer Science and Control of the Hungarian Academy of Sciences played a key role during a period spanning more than a decade to date.

Challenges: NoSQL-based storage of sensor data, unstructured data and other (public) data

More and more data is available due to digital services spreading like wildfire, and most of these data can be freely accessed through the Internet on servers run by various service providers. In addition to their volume, the diversity and heterogenous format of these data presents another challenge – it is worth using different methods for storing and processing text documents, data from social networks or values measured by sensors. The following introductory subsections will present four of the various approaches, with a special emphasis on their scalability and IT resource requirements in regard to cloud computing to be discussed later.

Text documents

Exceeding the limitations of the conventional relational databases *(SQL, Structured Query Language),* one of the most popular so-called NoSQL databases (Harrison, 2016) is the document-oriented MongoDB (MongoDB, 2015). Essentially it uses JSON *(JavaScript Object Notation)* and BSON *(Binary JSON)* formats that can be stored and processed more

efficient that the ubiquitous XML *(eXtensible Markup Language)*. It also supports setting up a distributed database on multiple servers if necessary, which provides good scalability thanks to the so-called replication and sharding techniques. Due to their architecture these systems may require significant data storage and network capacities in cloud computing.

Social networks

Graphs from mathematics are the best choice to describe connection network with edges, vertices, and their properties. Graphs can also be described using conventional relational databases, but querying such databases would be particularly resource intensive, and formulating the SQL requests themselves may prove to be cumbersome, because SQL lacks support for traversing graphs. In the past the so-called RDF *(Resource Description Framework)* and triplestores (Harrison, 2016) were used to describe connections. In the recent years more and more novel and popular solutions arose for the description of graphs, such as the open source Neo4j (Eifrem et al., 2015) – although it does not offer efficient support for splitting graph databases over several servers (see the above mentioned sharding technique), but it is still capable of storing and querying graphs with a billion vertices or more. Graph-based database solutions have significant resource requirements, mostly in terms of memory size, I/O (input/output) throughout and processing power in the cloud.

An agricultural precision project of MTA SZTAKI uses an HPE IDOL technology based solution to process newsfeeds and text documents received via social networking (see the details below).

Time series sensor data

Thanks to the fact that sensors consume less energy and grew smaller from day to day and to the ever increasing throughput of communication networks, sensor networks are gaining ground rapidly. Using a conventional row-oriented relational database (SQL) to store and process data captured from the sensors typically as a time series would provide a solution with very limited scalability due to the conventional structure in which the data is stored. A column-oriented approach allows for, among other things, reading sensor data in blocks, which is a must for efficient analytical and prediction algorithm execution. However, with a column-oriented storage solution data manipulation operations will take more time: usually this problem is tacked through the use of so-called delta storage devices or by batching write operations. For example, the column-oriented approach is used by the open source HBASE (Harrison, 2016) or the HPA Vertica (Agrawal, 2014) database too.

In its agricultural precision projects and Connected Car projects, MTA SZTAKI achieved considerable successes in research and development by using a cloud-based high availability scalable distributed Apache Cassandra (Hewitt, 2010) database (see the details below), targeting the processing of time series sensor data. Various implementations of column-oriented databases may require high data storage and networking capacities in the cloud.

Memory-based databases

The stringent requirements for data processing and evaluation usually prompt the designers of IT infrastructure to build a *real-time* system. One of the possible ways to achieve this goal is to move as many of the column-oriented NoSQL database tables as possible from disk storage subsystems with high response times to the operative server memory. Another factor that also supports this option is that column-oriented storage allows for extremely high data compression ratios, especially in the case of the above mentioned time series data (since it is enough to store the difference between the results of subsequent measurements instead of the values itself). Obviously, for memory-based databases, suitable mechanisms should be in place for regular synchronization of the operative memory and the mass storage subsystem in order to minimize the risk of data loss. There are two major systems that rely on memory-based databases and steal the limelight in their own respective areas: the SAP HANA platform (Harrison, 2016) and the open source Apache SPARK platform (Konwinski et al., 2015). Allocating the largest possible memory capacity to the so-called virtual machine running in the cloud is particularly important for memory-based databases – up to several hundreds of gigabytes of memory are available for such applications at public commercial cloud service providers.

MTA SZTAKI integrated the most recent release of Apache SPARK into its agricultural precision project (for the details, see below).

Solutions: properties, features, and current trends of cloud computing

Cloud computing was conceived with the basic idea of providing a cost-efficient, reliable, easy-to-access and scalable platforms that meet, among other things, the previously outlined various requirements even at recurring or occasional peak loads as necessary.

Characteristics of cloud computing

The definition of cloud computing was more or less finalized during the past decade; the most quoted definition (Sosinsky, 2011) came from the National Institute of Standards and Technology of the United States, and outlines the following key service criteria (see Figure 1).

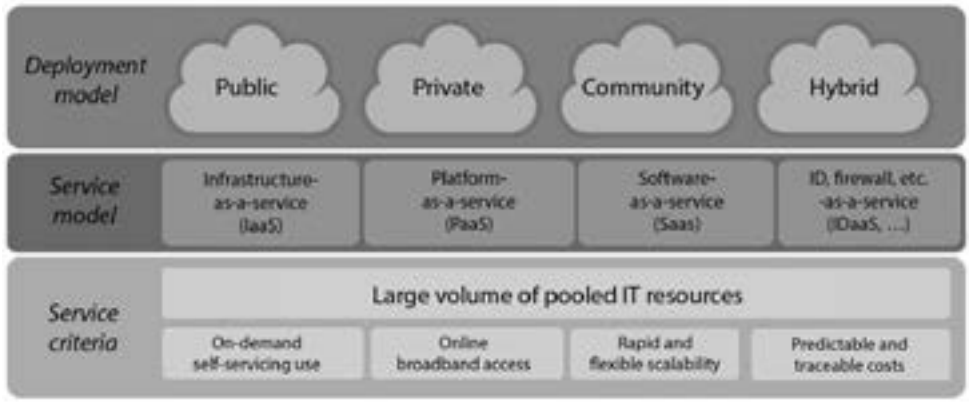

Figure 1

Deployment and service models and criteria for cloud computing

Source: Author's own contribution based on Sosinsky, 2011

- *On-demand self-servicing use:* The user of the cloud service can use either computing capacities (for a certain period of time) or storage space (e.g. within a certain quota). The process of requesting the service does not require intervention by the operating staff of the cloud service provider or organization: it is fully automated, and performed through a low-level programmable interface or a high-level (graphical or command line) user interface.
- *Online broadband access:* Cloud management services and computing, storage, network, and other capacities themselves can be used with the most popular standard access and high-level security protocols. This allows for accessing and exploiting cloud services remotely, using either a thin (mobile phone, tablet) or a thick (notebook, workstation) client.
- *Massive amounts of pooled information technology resources:* The information technology resources set up and operated by the cloud service provider company or organization usually service multiple users (clients) in a so-called multi-tenant model. In this model the available massive amounts of physical and virtual resources are dynamically reserved, allocated to the given user according to the received and automatically processed requests, and then released. Physical resources providing a given capacity requested by the user or, in certain cases, implementing a high-level service are reserved in large-scale clouds without regard to their location, if there is no constraint on geographic position. Due to legal and security considerations, however, users can specify the high-level location of the physical resources, for example, the region, the country or the data centre hosting them. A few examples of pooled physical resources: storage space (disk subsystem), processing capacity (multi-core CPU and GPGPU, which means servers based on general purpose graphics processing units), operative memory, high-speed network.
- *Rapid and flexible scalability:* While operating a given service or running applications, computing, storage, and other capacities can be flexibly allocated and released, even

automatically so that the service may be scaled or the running application may have access to more resources before the given resource limits are reached, in order to meet the ever changing needs.

- *Predictable and traceable costs:* In a multi-tenant system the cloud can automatically manage the pooled resources to optimize their utilization and make it as cost efficient as possible. In order to achieve this goal, quantifiable metrics characterizing the use of services by the individual users must be monitored and logged, including, for example, the size of storage space, processing (CPU) time, and network data traffic. The use of resources can be monitored and tracked (booked) by the cloud service provider in regard to the users.
- Service models

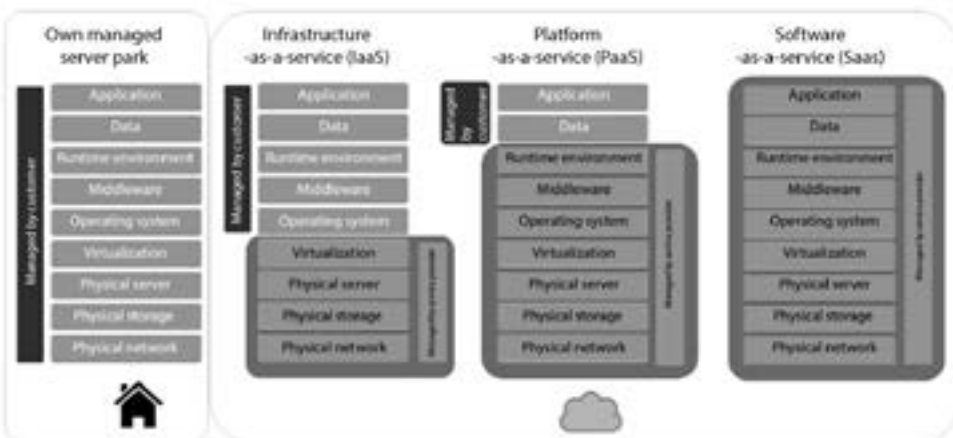

Figure 2

Comparison of service models

Source: Author's own contribution, based on Farkas et al., 2013

Compared to proprietary corporate information systems, a given cloud service may belong to three distinct categories according to the *service model* it implements (see middle row in Figure 1 and Figure 2). It is easy to see that proceeding from left to right the service provider manages more and more layers in all services models, and can hide in this way low level details of these layers from the cloud users:

- infrastructure-as-a-service (Iaas);
- platform-as-a-service (PaaS);
- software-as-a-service (SaaS).

ID (identification), firewall and VPN (virtual private network), etc. as security service are becoming more and more popular: considering the underlying concept, they can be interpreted in the platform-as-a-service or software-as-a-service model.

Deployment models

Possibilities of the various *deployment models* (upper row in Figure 1) (MTA Cloud):

- *Private cloud:* The most important feature of a private cloud is that it is operated for the exclusive use of a single company or organization, and typically only their registered and authorized employees have access to it. The emphasis is on "exclusive use" as the private cloud may be owned and maintained by the company or organization itself or even a third party, and the information technology resources may be located on the premises of any of these parties.

Note: Conventional data centres can be transformed into private clouds, but such a move requires, among other things, virtualization and automated resource management based on a suitable methodology, and furthermore a portal that supports self-servicing. It is also necessary to measure the use of resources. The in-house cloud of MTA SZTAKI is a private cloud that has been operating since 2012.

- *Public cloud:* In stark contrast to a private cloud, a public cloud can be defined as an information technology environment established for serving public business or private users. The owner and operator can be a company, an institute of higher education, or a government agency, and the physical IT resources may be hosted on its premises. An example of such a cloud is Amazon AWS and Microsoft Azure, both regarded as a pioneering solution in their own areas (Sosinsky, 2011).
- *Community clouds:* When examined from *the users' point of view*, community clouds appear as an interesting transition between private clouds and public clouds. As an example, we can point to the MTA Cloud established in 2016, which involves a federated cloud deployed and operated by two organizations of the Hungrian Academy of Sciences, Wigner Data Center and MTA SZTAKI, at both sites, serving the research community of the academy (see Figure 3), including research projects pursued by other organizational units of the operators.

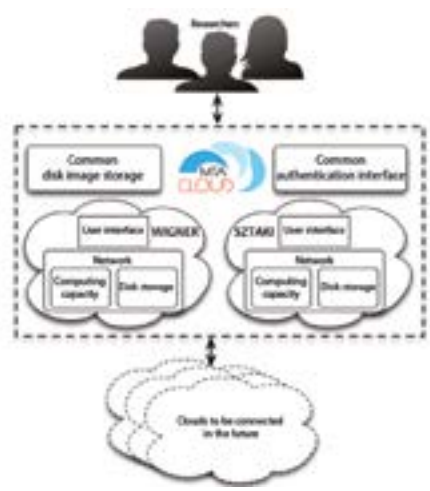

Figure 3

An example of a community cloud service

Source: Based on MTA Cloud, revised version

- *Hybrid cloud:* Considering its *physical IT resources*, a hybrid cloud is a result of a special combined use of a private and a public cloud. While both clouds (public and private) retain their independence, but through the use of network connections and suitable protocols, they can transfer (escalate) data and/or application between them as necessary. The most frequent applications of hybrid clouds are summarized as follows:
  - Requesting additional capacity from the public cloud: In such cases, even though the resources of the private cloud could grant the incoming requests to a limited extent, but if the load approaches or even exceeds the given upper limit, then new resources are allocated in the public cloud. Then, after connecting the new capacities to the resources in the private cloud, the public cloud will start processing requests constituting the extra load.
  - Segmentation of data: The currently applicable privacy policies and other security rules or regulations may restrict the scope of data that can be stored in the public cloud, including on servers located in other countries. In such cases, it is unavoidable that the data (and the services processing them) should be segmented as stipulated by the legislative environment: data regarded as sensitive will be stored and processed in the private cloud while data not subject to any restrictions will be processed in the public cloud.

Open source cloud platforms

Two open source cloud computing platforms and their various distributions have become the most popular: OpenNebula (Moreno-Vozmediano et al., 2012) and OpenStack (Radez, 2015). OpenNebula emerged from a European initiative, and due to its architecture, which establishes direct synchronous secure (SSH) connection between the nodes of the infrastructure, it is mostly recommended for building small and medium-size infrastructure-as-a-service (IaaS) clouds. Thanks to its low resource requirements and ease of deployment, it is very popular in the educational and academic sphere. In addition to the essential IaaS functions such as the management of users and virtual machines, it also supports the so-called *cloud bursting* feature (e.g. by using the hybrid cloud model approach) through the EC2 *(Elastic Compute Cloud)* (Sosinsky, 2011) interface that became a *de facto* standard for accessing other cloud resources if additional capacities are needed.

OpenStack started as a joint initiative of the National Aeronautics and Space Administration (NASA) and the company Rackspace, and by now it has become the most significant open source IaaS platform. On the one hand, it has an extremely large user and developer community, and a number of global enterprises chose to support this solution and have been using it for their own goals. On the other hand, its architecture, which is modular and uses asynchronous connections between nodes, allows for building even large-scale IaaS infrastructures. Also, it supports PaaS and so-called *bare metal* (e.g. GPGPU subsystem) provisioning. One of the leading OpenStack distributors is the company Mirantis and HP Enterprise with its Helion (HPE Helion Documentation) brand.

Commercial cloud service providers

The most recognized and the largest service providers include Amazon, Microsoft and Google (Sosinsky, 2011), but there are several service providers which are specialized or have a larger market share outside Europe that are worth mentioning here, such as Rackspace or Salesforce.com. By launching the AWS cloud services, which was driven by the effort to utilize unused information technology resource in the international enterprise's server centres, Amazon pioneered and shaped the market in the IaaS segment. Microsoft became a key player in the PaaS segment as its development systems can directly leverage platform services provided by Microsoft Azure (Farkas et al., 2013), which makes it easy for the developed software solution to benefit from its advantages. For many reasons Google is seen as the dominant market player in the SaaS segment: its mail (e.g. Gmail) and file sharing (Google Drive) services are also based on cloud computing.

NoSQL in the cloud

Cloud computing offers various methodologies and options for large-scale NoSQL-based data storage solutions. A frequently encountered basic architecture involves the use of some sort of NoSQL database in a distributed configuration with several virtual machines. Most of the PaaS service providers support such implementations, and thus, for example, the above mentioned Cassandra and MongoDB database are also available as part of Amazon's public AWS cloud services. In the case of distributed databases a special emphasis must be placed on fine tuning the consistency level: practical advice is available in that regard from several sources (Harrison, 2016; MongoDB, 2015; Hewitt, 2010).

Deploying a Hadoop service in the cloud

In connection with NoSQL based analytical tools there is a profound need for supporting MapReduce (Harrison, 2016) applications, the most popular implementation of which is the open source Hadoop. Now almost all cloud platforms and service providers offer support for such processing tasks: for example, Microsoft Azure uses the HDInsight brand name, while Amazon AWS and OpenStack call it Elastic MapReduce, and Google introduced the name DataProc. In OpenNebula the application is available on the marketplace in the form of Hadoop virtual machines.

There are already cloud service provider independent solutions that can use any private clouds: now the WS-PGRADE/gUSE (Kacsuk, 2014) system and Occopus (Kecskeméti et al., 2014) together can start Hadoop clusters in the clound and integrate them into complex workflows. For further details, see below and refer to the website of Occopus (Occopus project).

Designing complex scalable IT platforms for applications of public data for security purposes

Requirements

The following is a non-exhaustive description of a few of the key characteristics of a system that is potentially suitable for storing and processing public data in an advanced, cost-efficient way for security applications:

- Essentially, due to the sensitivity of the derived results, it is a *private or community cloud*, which is also suitable for hybrid operation as necessary.
- Support for not just MapReduce but also for *workflow based* solutions for data processing to promote simple use in order to reduce the workload of analysts and security experts.
- Wherever possible, *open source based* software elements are used due to economy (reduction of investment costs) and transparency related considerations.
- *Automated so-called "orchestration"* and *management tools* to optimize human resource costs of IT operations.

In the following, we will present four solutions related to the above four requirements, with a few actual implementation details for some of them.

Design of data, installation and workflow – orchestration

There are several techniques and software tools to describe data, installation and workflow processes in the scientific domain, such as Kepler (Ludäscher et al., 2006), and in the area of business applications, such as WS-BPEL (Vasiliev, 2007).

In both cases these descriptions allows for the use of acyclic directed graphs in order to create a graphical definition of the schedule of various interrelated activities (algorithms or even cloud-service deployment), the dependencies between them, followed by the execution of the produced complex processes (analyses, simulations, service provisioning) on the designated information technology platform, using a suitable data and workflow manager or infrastructure orchestrator. Such systems offer richer options to describe complex scalable solutions, including *parameter sweep,* and many of them support the design and coordinated use of various cloud-based computing platforms, such as the combination of the gUSE/WS-PGRADE (Kacsuk, 2014) workflow system developed by MTA SZTAKI since 2003 and the most recently developed Occopus (Kecskeméti et al., 2014) infrastructure orchestrator. Of tools designed for similar uses OneFlow within OpenNebula and TOSCA (Wettinger et al., 2013), which is favoured by the academic community can be mentioned as typical examples.

It is important to note that expectations regarding workflow-based description were already expressed at higher professional policy-making levels as mentioned in a report released by the European Union in 2010 (High Level Expert Group on Scientific Data, 2010). Working with scientific data, the expert group outlined in its report a framework for a collaborative data infrastructure that could be used by the EU to utilize the ever increasing

amounts of data produced. It is easy to see that the workflow appears explicitly at two levels in the framework: on the one hand, in the layer of support services through the generation of workflows, and on the other hand, in the combined shared data services through the execution of those workflows.

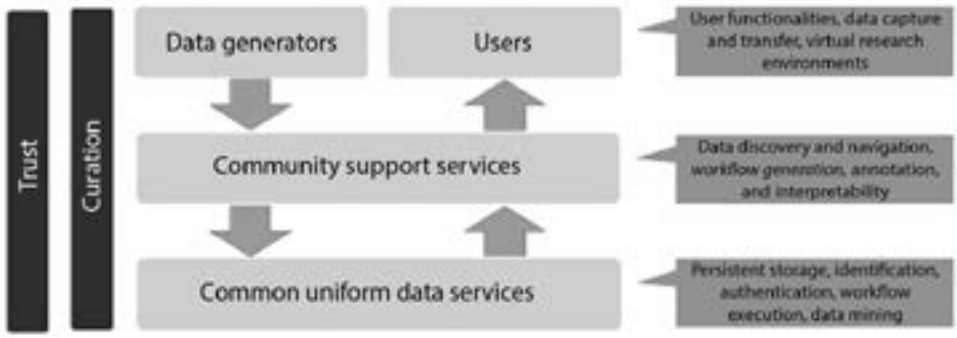

Figure 4

Role of workflow in collaborative data infrastructure framework

Source: Based on High Level Expert Group on Scientific Data (2010), revised version

Workflow description using gUSE/WS-PGRADE in the agINFRA project

gUSE *(grid and cloud User Support Environment)* is an open source workflow based so-called *science gateway* framework (Kacsuk, 2012) developed by the Laboratory of Parallel and Distributed Systems, Institute for Computer Science and Control, Hungarian Academy of Sciences. Its web interface, WS-PGRADE (see first row of Figure 5), which is available to registered users, offers user-friendly access to the development of distributed workflow based applications, and allows for executing them in clouds, in distributed computing infrastructures (e.g. grid) or in computer clusters. The gateway provides an interface between the expert and the distributed computing infrastructure that the expert intends to use. It is achieved through a combination of the benefits of the underlying technologies, including both front-end and middle-tier services, which are combined to build a gateway.

It is important to emphasize that the system is not dedicated to a specific area of application, which means that many other areas can leverage its benefits, which can be customized. Application developers have access to advanced workflow support services (abstract and actual workflows, templates, applications, and projects), which enables them to develop new workflow-based applications that can be uploaded to the gUSE application repository where common users can easily access and run them using the workflow-interpreter and the other middle-tier services (see the middle row of Figure 5). In this way, experts can focus on the meaningful part of their work instead of being bogged down by having to familiarize themselves with the specifics of various cloud-based infrastructures or maybe even creating them; the task management and data management tier support several popular distributed

information technology platforms and data storage technologies (see bottom row of Figure 5) through the DCI Bridge and Data Avenue components (Kacsuk, 2014).

The key objective of implementing the framework system was to make computing and storage IT resources easier to use for the end users in this way, regardless of whether they are in an OpenStack or OpenNebula based cloud or any other popular distributed computing infrastructures.

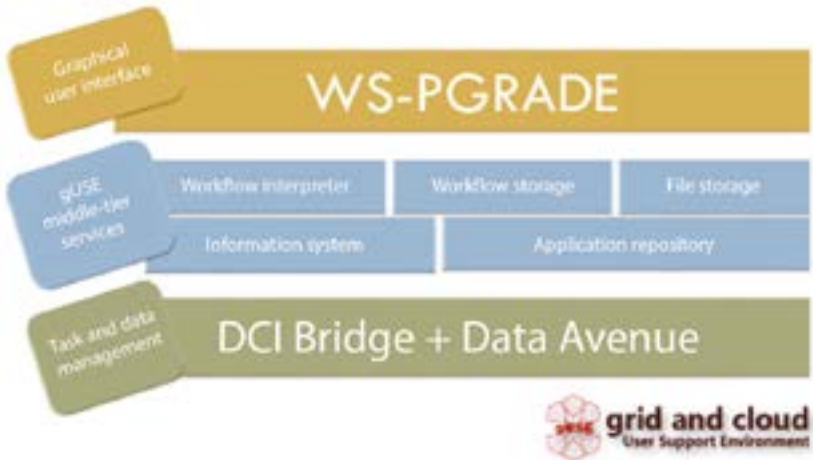

Figure 5

High level architecture of gUSE/WS-PGRADE

Source: Based on project EU FP7 SCI-BUS, revised version

The gUSE/WS-PGRADE system was added to several international projects of the European Union in more than thirty major fields of applications and communities (Kacsuk, 2014). The most important gUSE/WS-PGRADE solution-based project was SCI-BUS coordinated by MTA SZTAKI under the EU FP7 programme where the CloudBroker platform developed and adapted to gUSE became the first out of more than five hundred evaluated innovative solutions that were delivered as part of the 7th Framework Programme for Reseach and Technology Development, the Competitiveness and Innovation Framework Programme (CIP), and the Horizon 2020 programme of the European Union (De Prato et al., 2015).

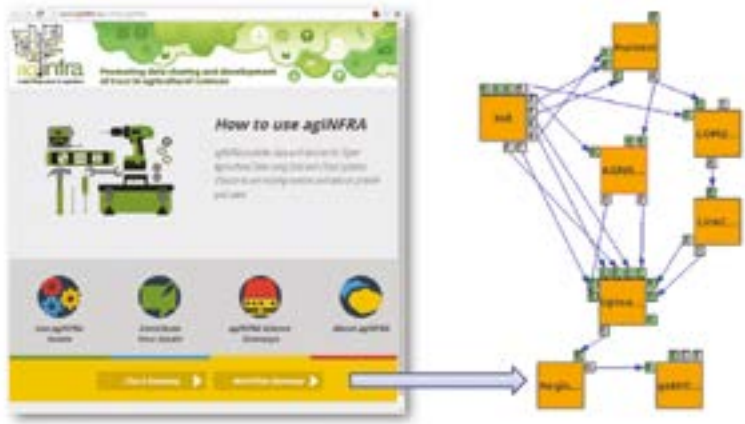

Figure 6
agINFRA science gateway and demo application: aggregation workflow

Source: The author's own contribution

Another key application under the EU FP7 programme was the agINFRA project where a specialized science gateway, a special portal (see left side of Figure 6) by customizing the gUSE/WS-PGRADE solution, and an *aggregation* workflow (see right side of Figure 6). The implemented solution (Balaskó et al., 2014), collects, among other things, documents and metadata to be indexed in the graph by using the CIARD RING metadata store and a reference collection pointing to international data warehouses, libraries, and repositories that focuses on documents of agricultural relevance (see the orange-coloured *Harvest* node), and performs data conversion and (e.g. *LOM2* and *AGRIS* nodes) checks as necessary (*Linkc* node). Dependencies and required data transfer operations between activities – i.e. nodes – in the workflow are defined by blue directed edges as shown in the figure, and with small numbered components.

Occopus infrastructure orchestrator

First of all, it is important to note that orchestration is more than simple automation because it integrates, for example, individual automated tasks into workflows. For example, a computer network orchestrator program typically checks the virtual local area networks (VLAN), selects the most capable one, then analyzes the network *switches* to identify the ones where changes are needed. Using the collected information, the program generates the required configuration settings and transmits them to the targeted active network devices. Then the program will continue to monitor them so that any issues that might arise may be corrected. This means that the orchestrator device combines and, depending on the circumstances (or changes thereof), coordinates the automated actions: in our example, this includes all phases from mapping the network, through configuring devices and applications, to managing the network. In short, it also controls the complex process of configuration management.

These days most of the large enterprises and organizations use server virtualization and cloud computing, which promotes the adoption of the orchestration methodology. Many developers have turned their attention towards automation and orchestration recently as organizations are forced to invest a lot of time and human resources into rolling out and commissioning their information infrastructures (including automating the installation of operating systems and applications, performing storage and network configuration, fine tuning firewalls, etc.) and into the maintenance of the deployed systems. As a result, orchestrator developers aim to create software that helps or perform on its own these often repetitive tasks that are so time consuming for humans.

When commissioning servers in an electronic infrastructure, coordination of the services and the configuration work required to accomplish it may consist of hundreds of complex steps that must be completed before a single server is put into operation. Installation and coordination of applications require complicated design and project management efforts for each component (server, storage space, virtualization, network, and security). However, regardless of the project at hand, commissioning involves progressing through a similar series of steps, even in the case of relatively simple solutions. When working with IaaS type clouds, the number of virtual servers and other singular resources may amount to thousands. Setting up, configuring, and modifying them would take a long time, but there are already orchestrator tools available to manage these tasks, allowing for the turn-key deployment of complex/complete infrastructures with minimum human involvement.

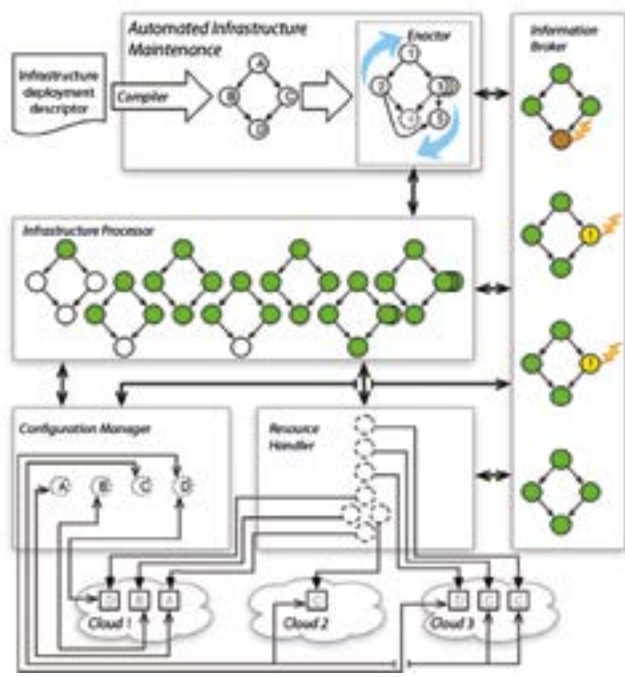

Figure 7

Internal structure of the Occopus hybrid cloud orchestrator

Source: Based on Kecskeméti et al., 2014 (revised version)

Figure 7 illustrates the main components, connections, and operations of the Occopus hybrid cloud orchestrator developed by MTA SZTAKI (Kecskeméti et al., 2014) from the infrastructure operator's point of view. The Occopus solution consists of five key components:

1. Automated Infrastructure Maintenance;
2. Infrastructure Processor;
3. Resource Handler;
4. Configuration Manager;
5. Information Broker.

Automated Infrastructure Maintenance

The automated infrastructure maintenance component is the only one that has a full view spanning all the parts of the operated infrastructure. It is also connected to the external world, and essentially performs two main tasks: on the one hand, it orders the execution of virtual infrastructure requests, and on the other hand it destroys existing but no longer needed virtual infrastructures in the cloud.

Its input is an *Infrastructure Deployment Descriptor,* which includes information necessary for building the virtual infrastructure: the types of infrastructure nodes, their dependencies, rules for error handling, such as handling management errors or over- or underestimated allocations. When the interface receiving the request get the descriptor, it is converted into an internal representation, see *Compiler* in Figure 7. If there is a compilation error, then the component will provide feedback, otherwise the process will continue.

The *Enactor* subcomponent is a basic part of the system: while building a virtual infrastructure, it sends the infrastructure processor requests related to nodes according to the order derived from the dependencies. Once the order is sent and the requested virtual infrastructure is completed, it will monitor the state of the infrastructure all the time in order to detect errors and it will resolve those according to the rules included in the infrastructure deployment descriptor.

These rules determine the activities that need to be completed, such as node redeployment, re-estimation of dependencies, if one of the nodes of a given type becomes inaccessible. For example, if the D-type (no. 4) node in the box of the automated infrastructure maintenance component shown in Figure 7 fails, then it will be substituted by node no. 5. Unfortunately simple rules cause so-called oscillation, and for this reason the enactor uses complex rules to eliminate the issue.

The enactor maintains the virtual infrastructure completely on its own, except if changes are needed in the infrastructure deployment descriptor. In this case, as the first step, the infrastructure maintenance component updates the descriptor, and then the Automated Infrastructure Maintenance component compiles the new internal representation of it, and finally the enactor switches to a transitional state. In this state, the enactor evaluates the differences between the old and the new internal representation and if it finds only new error handling rules, then the enactor will adjust them to the infrastructure; for example, if a new scaling rule calls for fewer instances under the same load, then the extra instances will be released through the infrastructure processor, and the enactor will revert to normal operation. If the evaluation finds new node types and dependencies, then the currently

operated virtual infrastructure will be reorganized according to the new infrastructure deployment descriptor.

Finally, when the virtual infrastructure is to be destroyed, the enactor will send destruct requests for all previously created nodes to the infrastructure processor. The order of destruction is reversed compared to that of creating the nodes, and in this way the dependencies of all node types are gradually dissolved.

Infrastructure processor

With the infrastructure processor, Occopus implements a new level of abstraction over the virtual infrastructure. As we saw in the previous part, the infrastructure processor receives note construction or destruction requests from the enactor. When the first node construction request is received for a virtual infrastructure, this component will create a so-called administrative group for the future virtual infrastructure. Nodes can share information among each other through this administrative group: for example, new nodes will get their dynamic properties (e.g. IP addresses) from the existing nodes.

Node construction requests are processed as follows: first, the infrastructure processor confirms that the configuration manager knows what type of node is to be constructed. As soon as the node type is known, the infrastructure processor virtual machine sends the request context to the resource handler component. Into the contextualized information, the infrastructure processor inserts a reference to the previously created administrative group and the expected node type of the future virtual machines.

In Figure 7, in the box representing the infrastructure processor, the process of construction can be seen from left to right, starting with the initial step and ending with the final state. The solid green circle indicates the already processed steps of infrastructure deployment. On the other hand, node destruction requests are forwarded by the infrastructure processor directly to the resource handler. When the final node is destroyed in the virtual infrastructure, then the infrastructure processor will also destroy the associated administrative group too.

Resource handler

The core function of the resource handler is to create a new general abstraction tier over the IaaS functions of the clouds, allowing for the creation, monitoring, and destruction of virtual machines. With the function comes a *plugin based* architecture, which can be implemented on most of the IaaS interface. At this time, Occopus supports OCCI, EC2 (Amazon), Nova (OpenStack), CloudBroker and Docker interfaces (Occopus project). These plugins are expected to carry out incoming simultaneous requests as soon as possible.

In order to improve the performance and flexibility of the deployed virtual infrastructure, the resource handler also provides a virtual machine scheduler, which works even across several clouds. The scheduler function of the virtual machine allows either the infrastructure operator or even the user initiating the virtual infrastructure to define the cloud selection criteria.

In our example, the order of the incoming virtual machine requests is shown by dotted circles in the resource handler box of Figure 7: the first one is at the bottom, the last one is at the top, while parallel requests are shown side by side. Requests to assign a certain virtual machine to a given cloud ("Cloud to VM") are marked by arrows, with little squares representing the actual virtual machine in the cloud. Every virtual machine shows the contextualized node types in grey letters (from A to D).

Configuration Manager

The configuration manager component manages the installed software and its configuration at node level, and a lot of widely used tools are available to that end. Component interfaces are provided, for example, for Chef, Cloudify, Docker, Puppet, and SaltStack. These applications use custom node type definitions (e.g. in Chef, they are called "recipes", in Puppet "manifests"). With already defined types of nodes, the configuration manager allows for the reuse of those definitions, even from external sources, and thus the conventional node type definitions will only serve as references to the custom definitions. Also, in the infrastructure deployment descriptor new node types can be defined in the extended node type definition. In this way, the definitions allow the configuration manager to select a suitable underlying node management tool: for example, if a "recipe" is used to describe the type of node, then Chef will be used.

Again, in our example shown in Figure 7, node type descriptions are represented by dotted circles within the configuration management component. Arrows between virtual machines and type descriptions indicate the connections between the virtual machines and the configuration management component as it receives and applies node type descriptions. These operations ensure the correct configuration of the software components needed for the virtual machines so they may play their role within the virtual infrastructure operated by Occopus.

Information Broker

The Information Broker component is designed to ensure that Occopus can make well-founded decisions in regard to the state of the requested virtual infrastructure (e.g. it can reduce redundancy, etc.). This is ensured by the information broker with two functions: request transformation and information aggregation. The first activity involves the information broker transforming sometime abstract or conceptual requests into actual information units that can be accessed by the various Occopus components and underlying clouds: for example, the request concerning the load of the D type node shown in the figure can be transformed into the CPU utilization of a virtual machine in Cloud 1 or Cloud 3. The second operation, information aggregation, takes place when the information broker receives requests that only contain composite information. In such cases it forwards the requests to each relevant Occopus component, and, if necessary, to the virtual infrastructure too. After receiving the responses from the components, the information broker calculates the aggregate value of the responses and returns it as a response to the original request.

In the example shown in Figure 7, the following is shown from top to bottom in the information broker box:

- State 1: At regular intervals the enactor sends a request to the information broker to ascertain the availability of nodes, and the information broker forwards this request to the nodes. The component does not receive an answer from the D type node, and as a result it declares the latter unavailable (the green circle representing the D type node is crossed out in red), which renders the virtual infrastructure unusable. For this reason, the enactor sends a new D type node construction request to the infrastructure processor.
- State 2 and 3: The C type node is under an ever increasing load. If the load is excessive (the green circle representing the C type node will turn yellow and an exclamation mark will indicate excessive load) and the given virtual machine can no longer handle the expected load, then the enactor will increase the number of C type nodes, thereby reducing the load on the individual C type nodes.
- State 4: All nodes types are working properly.

Reference: Agrodat.hu project

In the following we will describe a Hungarian reference platform that offers a solution for sensor and image data processing and thematic processing of social media and open document repositories, mostly based on open source cloud computing and big data. It can be adapted extremely easily not only to environmental but other security related applications as it was developed according to, among other things, the above defined requirements.

Figure 8

High level overview of the Agrodat.hu project

(1) data sources: sensor networks, international data warehouses (top) and (2) research platform: analytical and decision support software elements, big data server park (bottom)

Source: The author's own contribution

As part of the Agrodat.hu project, MTA SZTAKI designed and implemented a regionally unique and exceptionally large scale research infrastructure aimed at promoting precision agriculture. Precision agriculture is meant to reduce risks arising from decisions made during agricultural production and from changes in the external environment, allowing for cutting back on the use of fertilizers and plant protection products, and achieving sustainable growth of the average yield. In this way, significant improvement can be realized in the area of environmental security.

By adapting the big data and cloud technology based analytic, forecasting and decision support framework to agricultural applications, the newly developed platform enabled the creation of a constantly extended knowledge base with an ever wider scope for the agricultural segment. The research group enabled the system to use a NoSQL (Cassandra) based solution (Hewitt, 2010) to reliably and efficiently collect structured time series, image and other data from a huge number of sensor columns installed in the field by partner companies, and to efficiently exploit information contained in those data with the assistance of agricultural experts, using Apache Spark (including, among other things, Hadoop) (Konwinski et al., 2015). Also, as a result of the agINFRA cooperation between the institute and the Food and Agricultural Organization of the United Nations under the FP7 programme (Balaskó et al., 2014), and with the involvement of additional industrial partners such as HP Enterprise and its strategic partner, non-structured data of international open data warehouses and community sites of agricultural relevance can be intelligently searched and integrated into the knowledge centre.

Collection of sensor data using a scalable NoSQL approach

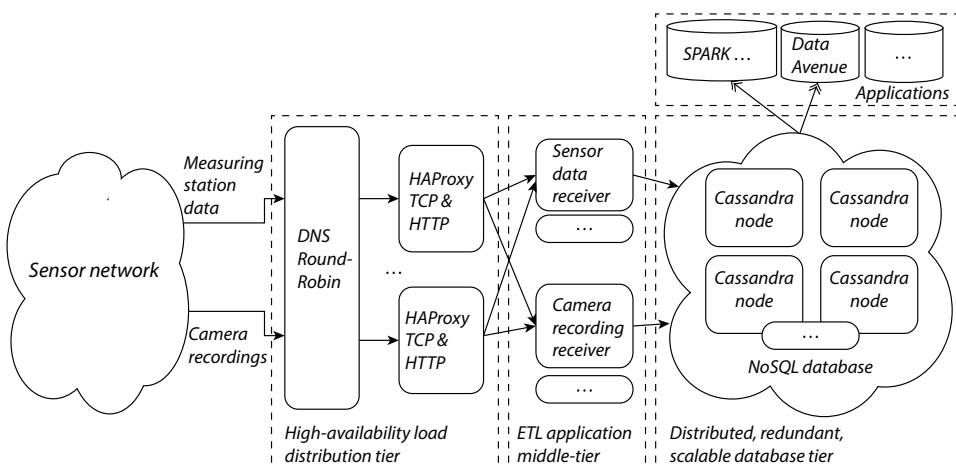

Figure 9

Agrodat.hu data collection platform with additional NoSQL data storage solution and other applications

Source: The author's own contribution

The first stage of receiving data from sensor networks is a high availability load distribution tier where a *round robin* algorithm is used to direct sensor data towards high availability *proxies* via HTTP/TCP protocol based communication. After this stage, the next tier contains redundant, sensor data dependent data pre-processors – so-called data receivers – in the ETL *(Extract, Transform, Load)* middle tier, which forward data for storage to the next tier, the distributed NoSQL database (Harrison, 2016). In the database tier, an Apache Cassandra based (Hewitt, 2010) NoSQL cluster was set up, which, on the one hand, is capable of storing huge volumes of input data quickly (basically, it handles database write operations), and on the other hand, it can efficiently perform the mostly read type database operations of the top-tier analytical (Apache SPARK [Konwinski et al., 2015]) and data transferring subsystems (Data Avenue, [Hajnal et al., 2015]), thanks to the support of consistency level tuning in Cassandra. It is important to note that as a result of this project, the data collection and storage infrastructure shown in Figure 9 can be deployed automatically and in an orchestrated manner through the use of the above discussed Occopus (Kecskeméti et al., 2014) solution in, for example, an OpenStack based cloud (Radez, 2015).

Intelligens search using IDOL

As part of the Agrodat.hu project, a service was developed to aggregate and organize non-structured data from thousands of various digital archives and other sources dedicated agricultural topics, including scientific papers, Facebook entries, educational materials, and other reports, and to make them searchable in an intelligent way, using open source as well as closed source software. The core of the system is a version of the HP Enterprise IDOL (HP Enterprise) search engine *(enterprise search engine)* licenced for 5 million documents. The data collection method (ETL), the user interface *(frontend),* and the agricultural dictionary that serves as an ontology are based on open source solutions and academic development efforts, thanks to the cooperation between ICSC and the Food and Agricultural Organization of the United Nations in the past.

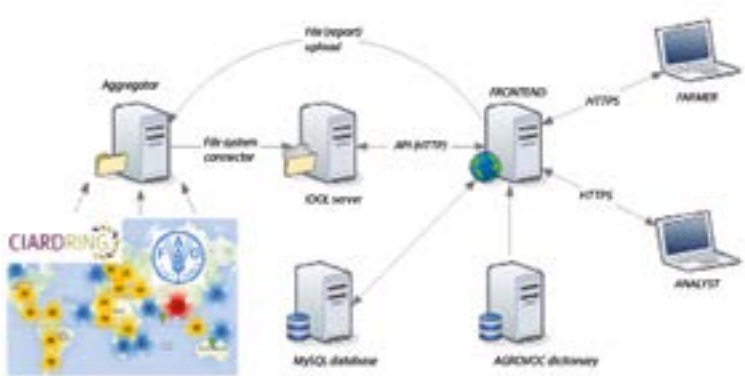

Figure 10

Intelligent search feature using HPE IDOL server and Agrovoc dictionary

Source: The author's own contribution

The solution developed as part of the project (see Figure 10) allows farmers and analysts working in the agricultural sector to explore relevant information. Access to information is provided by a *frontend* application that can be accessed with a web browser. The key function of the frontend is to expose the intelligent document search feature to the users, with additional administrative functions as necessary. Information needed by the frontend is delivered from two sources: one of them is a relational MySQL database that store conventional structured data needed for operation, and we also have access to a HPE IDOL server which stores and indexes unstructured natural language text documents. Indexes of the IDOL server are built from documents of various formats that are located at pre-selected locations in the file system. This means that the file system is one of the interfaces to this solution. Moving files from repositories in CIARD RING to the workspace is carried out by an *aggregator* software, which is based on the aggregator that was developed as the already described gUSE/WS-PGRADE workflow developed for agINFRA.

At the bottom of Figure 10 is another element: *Agrovoc* (Balaskó et al., 2014) is a dictionary that contains agricultural terms and phrases in 22 languages, with more than 30,000 important phrases of the agricultural jargon, and is capable of interpreting various relations between the expressions, such as synonyms and root terms (i.e. its data structure corresponds to a graph). The dictionary is available in several formats, of which we prefer the RDF format as we have access to open source solutions to read and query files created in this format. The system uses *Agrovoc* to offer, among other things, reasonable and accurate recommendations to users as they compose their search expressions, even in a different language. The system is also capable of processing data from social media sites: listing of relevant hits and similar functions work in the same way as in the case of data obtained from CIARD RING (Pesce et al., 2011) using the aggregator.

Figure 11 shows the search interface, which uses *Agrovoc* to offer accurate search term recommendations in multiple languages, for example, when entering the keyword *maize* or *kukorica* (see the drop-down list boxes at the bottom on the left and in the middle at the top of Figure 11). The search for *maize hybrid* returns the list of hits that is show in the middle of the figure, together with the list of the recommended related subjects on the right side. In response to a search for the word *disaster*, the system will list hits from agriculture related Facebook community newsfeeds (see upper right corner of Figure 11). For every hit list, we will get a relevance indicator estimated by IDOL, and it is also possible to refine searches using various logical expressions, even by defining the maximum distance between the occurrences of the given keywords.

Figure 11

The intelligent search engine interface of Agrodat.hu with illustrations

Source: The author's own contribution

The cloud-based Big Data infrastructure of Agrodat.hu

Commissioning of servers and information technology equipment needed for the operation of Agrodat.hu research infrastructure in the live environment was completed in stages using Hadoop, GPGPU and blade servers, and a particularly fast data storage subsystem (3PAR), which were integrated on the above mentioned OpenStack open source cloud platform, using Infiniband and a 40Gbps network.

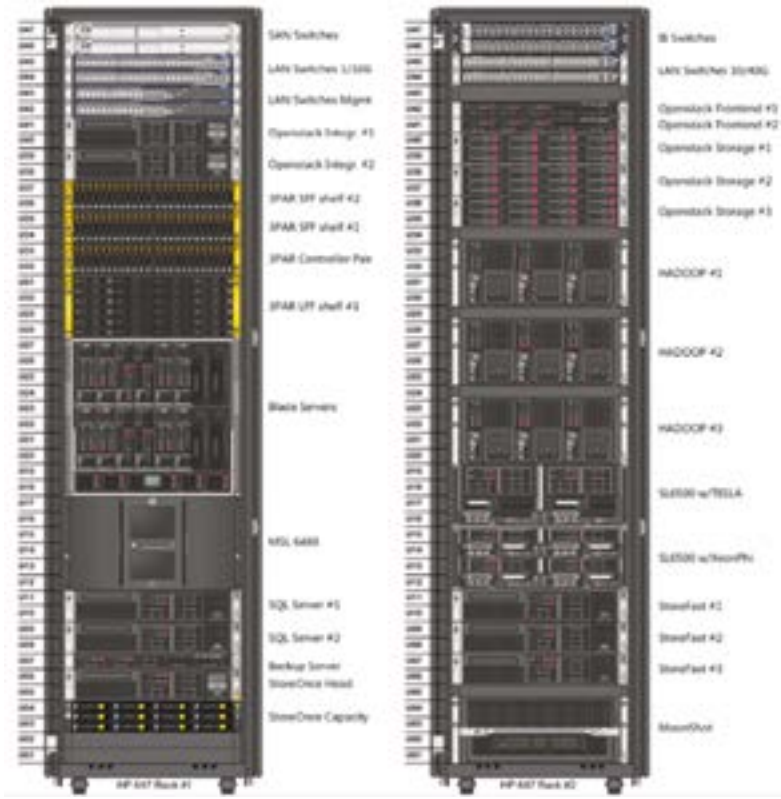

Figure 12

Research infrastructure – hardware configuration of the big data server centre of Agrodat.hu in two rack cabinets (network components, storage units, blade servers, database servers, tape units, cloud components, Hadoop [big data] and GPGPU servers, etc.)

Source: The author's own contribution

Directions of further development: the cuvée strategy

The cloud based big data platforms are gaining ground rapidly in the various application segments where the amount of data to be processed is undergoing an explosive growth. In this area, solutions can be divided into two major groups: *open source* and closed source *(proprietary)* platforms. Open source allows for, among other things, reducing investment costs and vendor dependency. With proprietary systems, the same could be achieved by using public cloud based on-demand services, however, it is often not feasible for big data systems due to, for example, the sensitivity of data or the exorbitant costs of data transfer. It should also be mentioned that if open source solutions are used, the availability of acceptable support and maintenance services, and the selection and integration of compatible software products may cause problems.

Among the potential new users of cloud-based and big data systems in the so-called *long tail* stage there are small and medium enterprises and start-ups, which are innovative but not so well-capitalized, and there are the small and medium-sized research laboratories and organizational units of the state owned institutions (universities, academies, public administration, home defence, etc.), which often prioritize open source, but fail to use the proper methods to build their IT infrastructures. As a result, the competitiveness of their R&D and other core activities is considerably reduced. In order for these segments to leverage the benefits of the cloud and big data – with the lowest possible cost of entry and vendor dependency – an approach that combines the best of both worlds should be developed and deployed as a platform: essentially, this is more or less the gist of the *cuvée* principle.

In connection with research efforts related to such a new approach, a successful *pilot* operation was launched as part of the Agrodata.hu project at the time of deploying the big data based and agriculture oriented (precision farming) knowledge centre and research infrastructure. Medium-term plans call for using the new approach, in addition to data obtained from the agriculture and UAVs, to meet the requirements of other fields, based on the accumulated experience. The targeted audience includes Industry 4.0 players, e-healthcare, automotive industry, telecommunication, and financial service providers as well as fields closely related to security (e.g. chemistry, meteorology, environmental protection and national defence), which, as a result, will be provided with increasingly accessible and efficient cloud-based support, specifically by performing simulations, real-time analyses and other mathematical modelling activities on a Big Data platform.

Achieving this goal is furthered by a stable technological foundation and knowledge base thanks to the fact that, due to its above mentioned reference projects, MTA SZTAKI became one of the dominant players of the region in the field of migrating workflow based large scale and complex research applications to distributed computing (EU FP7 SCI-BUS project), cloud-based (EU FP7 CloudSME project) and self-organizing, volunteer platforms (EU FP7 IDGF-SP project). Meanwhile significant steps were taken in the institute in the research of one of the cornerstones of the new research approach: the interchangeability, suitability for system integration and interoperability of e-infrastructure components (EU FP7 SHIWA project). The targeted research project builds on the above results and the development efforts of the recently launched *One Click Cloud Orchestrator* (OCCO) (Kecskeméti et al., 2014) and *Data Avenue* (Hajnal et al., 2015) projects. As such, the platform to be built will be able to work with several large component suppliers, and even automate and orchestrate the automated instantiation and/or accessing of their proprietary big data components (Harrison, 2016) (NoSQL, stream based processing, Hadoop, machine learning, etc.) as well as their integration, scaling, and operation with open source software solutions.

As a key benefit, the new *OCCO* generation, the *Occopus* (Occopus project) will, in the long run, enable orchestrated deployment and operation of a big data research platform in either a private, a public or a hybrid cloud that is scalable depending on the load, taking into account the user's budget and actual requirements (e.g. sensitivity of data). All this is to be achieved, with as little human intervention as possible, by combining the benefits of open source and proprietary solutions and ensuring the lowest possible level of vendor locking.

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Tamás Szirányi – László Havasi

Observation on Earth and from the Sky How Can the Events Embedded in our Environment Be Made into Useful Data?

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László Rajmund Havasi, Research Fellow of the Institute for Computer Science and Control, Machine Perception Research Laboratory of the Hungarian Academy of Sciences

Abstract

Our safety is based on the continuous monitoring and evaluation of the measured world. The detected images may come from surveillance video systems, on-board systems of vehicles or even from satellites. With the development of technology, the types of sensor devices, the perceived contents of the physical signals, or the placement has become diverse: observation is possible from virtually anywhere at any time. We require new mathematical solutions or information management procedures for the analysis of information perceived from different observation points at different time instants, and comparing and evaluating data concatenated in space or time, interpreting events or situations as complex problems. In this article we briefly describe the typical measurement data and equipment storehouse, indicating what tasks and opportunities arise in the understanding of the dense world of detected signals.

Keywords: observation, recognition, sensor-networks, video camera system, area surveillance, Earth observation, remote sensing, biometrics

Introduction

Video surveillance systems first became ubiquitous in large cities, and were followed by the security systems of banks and certain public buildings. At the time, cameras were actively monitored by operators. If there were multiple cameras installed, the security staff checked the video feed switching between cameras on a split screen. However, when there was a camera at every corner, most of them working in scanning mode, the number of video moni-

tor personnel rocketed beyond the manageable threshold. Later, security cameras became an important fixture of houses and apartment blocks. Most people no longer bother to look at them: the knowledge that acts of crime can quickly be investigated and solved by reviewing the recorded material makes them feel secure enough.

Placing cameras on public passenger transport vehicles is meant to have the same effect.

However, with the rise of terrorism, prevention and constant monitoring became important again. In order to overcome the difficulties arising from excessive workload and lapse of concentration, at least the filtering aspect of receiving video streams should be automated and relevant information should be provided to the operators, which means that information should be filtered out during pre-processing. Recently artificial vision functions of self-driving vehicles came into the limelight and automated aircraft were added to the military arsenal for aerial reconnaissance and intervention. These use several sensors some of which might even operate on the basis of different principles, and the goal is to fuse their data and extract (semantic) information of higher value from them.

These new sensing technologies gave rise to new problems. It is not just law enforcement and area defence that employs new devices, but criminals too: detection and elimination of UAVs equipped with spy cameras or posing a terror threat has become important. We only have a few years to develop countermeasures against the emerging new technologies while technical progress in this area has accelerated extremely.

Tasks

Area defence

Fences and walls are meant to keep people out, but they only provide physically limited defence. Active surveillance devices allow for constant monitoring and alerting operators to suspicious movement. All surveillance methods can be evaded by, for example, moving skilfully, hiding, blinding the sensor, or disrupting the network. The simpler the system is, the greater the danger that a well-prepared criminal will circumvent it. If we use multiple sensors (optical, infra, PTZ motion detection, wide-angle, and full panorama), then we have a chance to thwart trickery. Automated alerts can be extremely important as they can help security guards whose attention has lapsed immensely.

Proactive anti-terrorist surveillance

The movement and appearance of terrorists differ from the way ordinary criminal intruders act. Beyond a certain point they do not aim to conceal themselves; rather, they strive to act quickly. In order to frustrate their efforts, an extended alarm zone must be created around the facility, and special behaviour patterns typical of terrorists must be detected in time. Proactivity is particularly important so that preparations may be detected as early as the preparatory/reconnaissance stage. These clues that warrant suspicion might be insignificant in themselves, but multiple factors may justify triggering an alarm. Such a clue could be

when a van pulls over, but nobody gets out of it, and a motorist appears who seems to be surveying the area.

Disaster Management

In the event of disasters that occur or have already occurred (e.g. gas explosion, flood), the target, the participants and the environment are well defined, but there is no enemy to overcome, only a task that must be tackled. In such a case, speed is crucial so you can deploy the most capable sensors near the target as soon as possible: robot sensors, UAV vehicles with on-board cameras and chemical detectors, and fixed cameras to detect changes. Fusion of various data sources, for example, comparison of daily satellite images with data from cameras aboard UAVs on mission can be important to that end.

Tools to detect secure environments

The tools of visual detection are mostly high-resolution colour and infra cameras as well as depth sensors that can (also) detect spatial distance, and the hybrid versions of these devices.

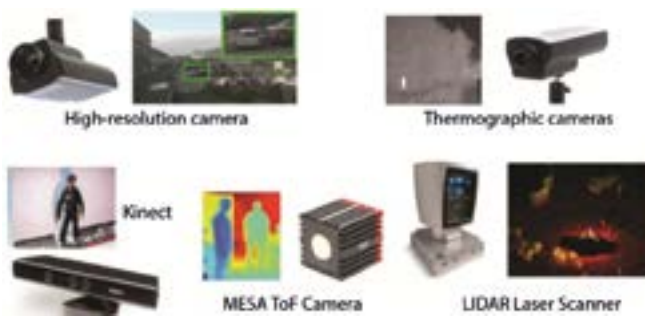

Figure 1

Imaging elements of security systems: cameras and depth sensors (3D)

Source: The author's own contribution

Cameras

Today camera resolution is in the 30 to 150 MP (megapixel) range. If it is paired with high quality optical elements, then its true resolution can show very fine details. A good zoom camera can display views from wide-angle images to finely detailed close-ups. It is important to note, however, that if the resolution of the image sensor matrix does not match that of the optical elements, we will get a poor quality or even corrupted image.

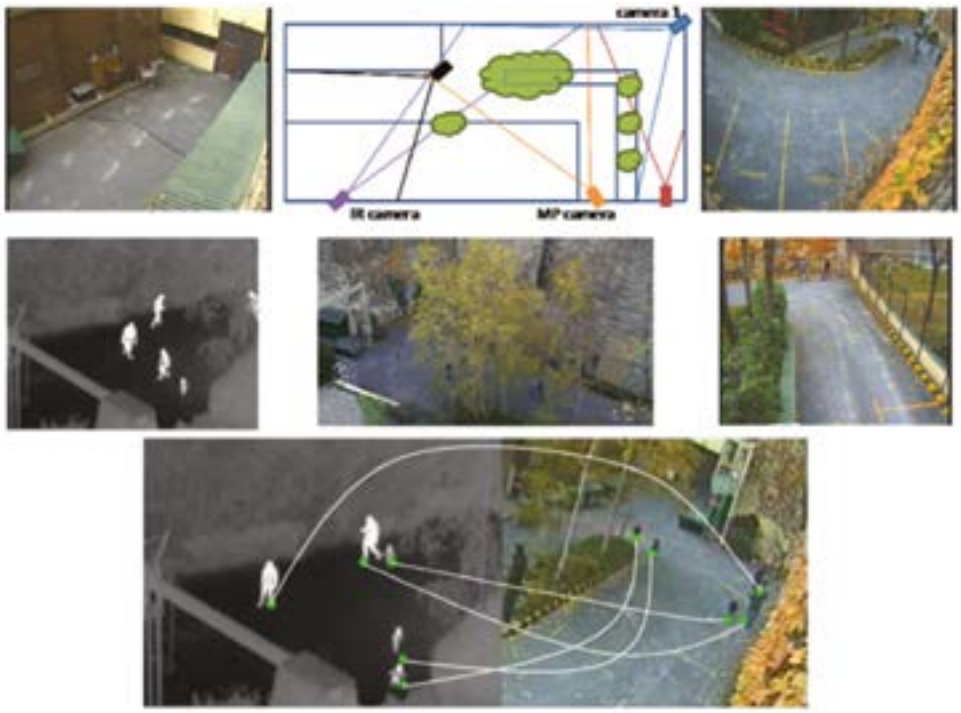

Figure 2

Camera images taken at various locations[1] (correlation between moving objects in various views is established through the use of 3D calibration procedures)

Source: Kiss–Szirányi, 2013; Havasi et al., 2014

Depth Sensors

3D (or, rather, 2.5D depth) cameras are already available in the market. As the technology becomes more sophisticated, they will be used in large numbers, replacing/supplementing stereo technology. Their scale ranges from toys to expensive laser scanners.

Kinect

The computer gaming industry created the Kinect[2] sensors that can recognize hand gestures, allowing for virtual control over any movement. This device was essentially conceived as a toy, but it grew out of this role, and it is now used in, for example, medical diagnostics. Its range is limited and it only works indoors, just like many other devices designed for similar uses.

[1] ProActive project (EU FP7) of HAS ICSC, http://cordis.europa.eu/project/rcn/103500_en.html

[2] https://developer.microsoft.com/en-us/windows/kinect

ToF

In time, however, cameras[3] that, in addition to normal images, create depth images too have been released. The principle of their operation is based on assigning a *time-of-flight* value to each pixel of the refracted reference radiation, which can be used to create a depth map. Theoretically these cameras can be used outdoors, but their accuracy (about 1 cm) and their sensitivity still need to be developed further. However, they can provide a high frame rate (about 160 fps).

Laser scanners

In LIDAR[4] devices, a laser beam scans the environment. The laser light typically has a wavelength in the 600 to 1000 nm range. With regard to the mode of operation, they have two basic types:

- A static or architectural LIDAR: they are placed at a certain location, and then a rotating mirror system scans the environment within a radius of 200 to 300m, and provides results about the surrounding 3D structure (point cloud) with an accuracy of millimetres. The point clouds can be numerically evaluated: objects and surfaces can be identified, and meshes can be laid over the surface. Repeating the measurement after a long time the two measurement results can be matched in 3D, even if they were taken at two different locations. This allows for finding differences, for example the tilt of columns and the displacement of walls can be accurately measured. This feature is also used for forensic investigation of accidents or documenting archaeological excavations.
- Dynamic LIDAR devices: these are laser scanners mostly made for self-driving vehicles (type Velodyne[5]), which create mappings at a rate of 1 million spatial points/s, using multiple beams vertically while rotating horizontally with a sampling rate of 20 rotations/sec. They can assist the self-driving functions of cars in 3D, map spatial street views, recognize 3D shapes (Rózsa-Szirányi, 2016), and measure real-time spatial movements.
- A variation of the first two categories where the second scanning direction of a LIDAR that is scanning in single or multiple lines is determined according to the speed of the carrier vehicle for scanning, for example, tunnels and walls of buildings.

[3] http://hptg.com/industrial/

[4] Laser radar.

[5] http://velodynelidar.com/

Figure 3

3D point cloud of a LIDAR scan[6] (on the left) and a 360° panorama image captured through the lens of a PAL[R7] panorama camera, taken of the same location (on the right)

Source: Author's own images

Sensors installed on UAVs

The popularity of unmanned aerial vehicles is growing, and their capabilities and on-board equipment are progressing rapidly. Their flight time keeps increasing, while the capabilities of the devices installed on them are getting better and better, with a parallel decrease in weight.

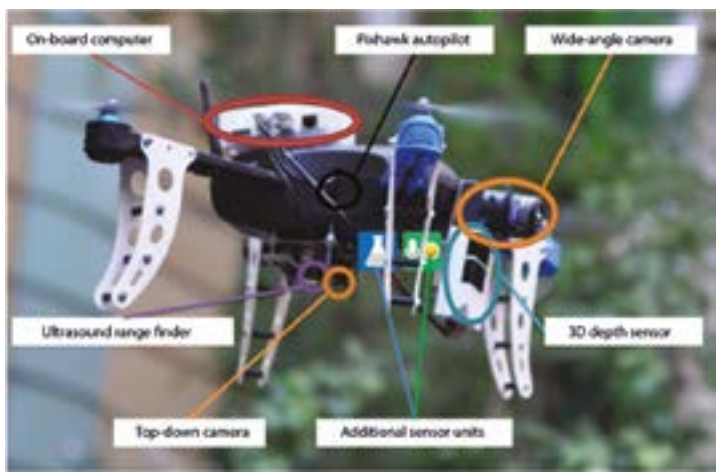

Figure 4

A quadcopter equipped with cameras and other sensors – these vehicles are becoming safer (automated return-to-home and landing unit) and their flight distance has also been increasing

Source: Illustration of András Majdik (2015)

[6] Recognized pedestrians are coloured (Csaba Benedek and his colleagues, i4D project, HAS ICSC, Budapest).

[7] Invention of Pál Greguss (BME, 1983); it was purchased by the Japanese company Tateyama, and was manufactured by Sony until recently. Patent has expired.

Aerial and satellite photos

The quality of images downloaded from satellites and their access time are improving. Various images from the Sentinel satellites of ESA can be accessed from a given area several times a day, and at no cost.[8] In this way, security surveillance and monitoring is available from space. Combined with aerial photos taken by UAVs, satellite pictures can provide us with an up-to-date, inexpensive and easy-to-access source of images. In addition to security management, the other beneficiaries of this service are disaster management, agriculture, regulatory supervision (built-up areas) and environmental protection (e.g. detection of massive deforestation).

Figure 5

Automated detection of built-up areas from aerial photos (detection of populated areas is shown on the right side)

Source: Kovács–Szirányi, 2013

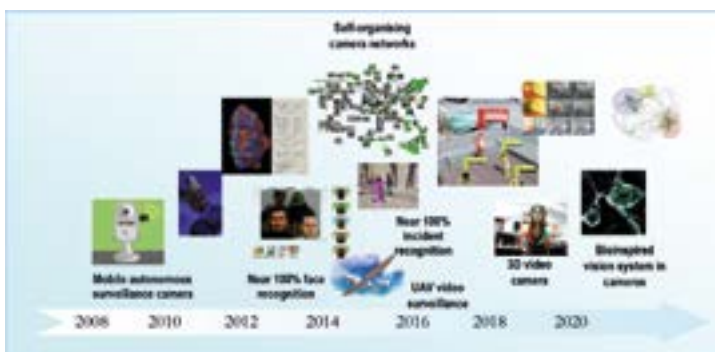

Figure 6

Development of the individual technological elements (the years are conservative estimates, the actual progress may be faster in the upcoming years)

Source: Petrás, 2008

[8] https://sentinel.esa.int/web/sentinel/home

Special data and how to manage them

Depending on how the data was generated and the type of target area, there are various rules applicable to the storage and processing of captured images. Sensitive data may include biometric properties (e.g. face, fingerprint), but in certain cases, even aerial photos. Data management should take into account privacy rights and information values. Often, if the data have already been interpreted and the essential properties have been extracted, the original data are no longer needed (they can be deleted), and thus a large database can be created by processing sensitive data, but without ethical/legal ramifications. Data generated by the analysis of image data may often contain image sets and camera images taken from multiple views. In such cases, linking the individual images together requires the application of the efficient tools of multiple view image geometry and motion analysis, which, in turn, may necessitate adding extra computing capacity and a linked database. This might also entail the use of data processing centres, including, for example, cloud architectures where data security is of particular concern.

Biometric analysis

Certain biometric properties such as facial image, fingerprint, and signature have become legal means of providing proof of identity. Other characteristics such as iris, retina, and palm scans, and chemical properties also play a major role in security technology. But there are other properties, for example, the detection of gait (Havasi et al., 2007), body structure, facial expressions, hand gestures, that can facilitate the detection of a limited group of persons or, rather, the tracking of their motion as they pass through several sensors' detection areas. The security of biometric data is very problematic, and filtering out fraudulent attempts requires complex procedures (e.g. using fingerprints together with thermal images of the hand). It is required in this professional field that data captured for authentication (e.g. for an access control system) should be incomplete, which means that these system should only extract and store as much information as absolutely necessary and automatic merging of various databases should not be possible.

Information technology background

Storing the increasing number of differently sized images, indexing, processing and searching them in databases, and comparing file content (e.g. to detect changes between different points in time) is becoming more and more difficult. Working with large database falls within the domain of Big Data, while processing images and recognizing objects (Varga–Szirányi, 2016) are tasks that require machine learning (e.g. deep learning) and the processing of large databases. Processing data from each successive year necessitates the use of new mathematical procedures that rely on stochastic optimization (Szirányi-Shadaydeh, 2014). Calibration of various tools, co-registration of images (Varga et al., 2015), and fixing distortions is impossible without serious mathematical capabilities; research and development in this area requires constant efforts. In order to promote human management and

database look-up activities, the automated filtering and learning procedures of large image databases present the greatest challenge in the area of artificial intelligence.

Legal background

The use of cameras in public spaces is restricted by legal provisions that were prepared with the involvement of the authors (Petrás et al., 2008). Today it is only natural that image capture devices record events in public areas, including vehicle related incidents. Retrieving these data is only permitted if the applicable authorization is obtained, and thus such data do not violate privacy. We have already grown accustomed to the presence of cameras everywhere – all for the sake of our protection. Taking aerial photos by using UAVs is subject to legal restrictions; banning such vehicles from private and protected public area is technically feasible (e.g. by integrating the solution into the navigation system's database). As in the case of mapping and data storage regulations pertaining to public camera systems, publication of recordings taken in public areas is also subject to legal restrictions, and it is regulated accordingly.

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József Bokor – Bálint Vanek

Research Directions of Unmanned Aerial Vehicles

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Abstract

Unmanned aerial vehicles are undergoing an extensive transformation in these days. Along with the penetration of large-scale military systems that require considerable logistics, commercial applications are also becoming widespread. These vehicles are equipped with a number of microelectronics- and mobile web-based tools. The major obstacle ahead is the safe integration of these vehicles into the airspace, which is both a legal and a technical challenge. The technical steps towards these goals are highlighted in the article.

Keywords: unmanned aerial vehicles, integration into the common airspace, communication systems, human-machine interaction, navigation systems, sensor fusion

Introduction

Unmanned aerial vehicles or, more commonly, drones have undergone a significant transformation in the past decade. In addition to their deployment in large and expensive military systems, the development of microelectronics and computing allowed for the civilian and recreational use of these small-size vehicles. Today, the two fields are starkly distinguished, because military UAVs fly long distances in restricted airspaces under constant remote control, while in civilian use, the flight of small vehicles is only permitted within visual range, and mostly for taking aerial photos.

Figure 1
Launch of a senseFly eBee aircraft

Source: sensefly.com

Figure 2
Global Hawk and Predator military UAVs, and an F-16 fighter jet

Source: http://web.ipmsusa3.org/content/rq-4b-global-hawk

In the future, the gap between complex and expensive military systems and cheap, simple and small-size civilian UAVs will disappear. What is uncertain is the time when it will actually happen as, in addition to addressing legislation issues, a lot of technical problems need to be resolved. Because the UAV industry does not currently have a significant market due to the above mentioned lack of legislation, most commonly the products of spin-off companies that draw on the findings of direct research appear in the applications. The expenditure on research exceeds 30% of the total costs. The economic potential, however, is clearly marked by the projections indicating that in the next ten years the total amount of UAV sales will represent a 91-billion dollar global market, which exceed the GDP of Hungary in 2003. The key to significant progress is to integrate drones into the common airspace, because there are already operational experimental systems for various fields of application (agriculture, cartography, environment perception, telecommunication, etc.), but they cannot be used on a regular basis on account of airspace restrictions.

Research challenges

The current major research areas can be divided into four large groups:

1. communication,
2. activities conducted in airspace,
3. unmanned aerial vehicle and its systems,
4. human-machine relationship.

In the following we will elaborate on the research needs of the four key areas.

Communication technology

Communication technology is an integral part of all UAS systems (unmanned aerial systems) because not only uninterrupted communication must be maintained between the pilot/operator and the vehicle in order to control the aircraft, but sensor data must also be downlinked to the ground personnel for decision support.

Figure 1

Complex communication system supplied by L-3 Communications for the satellite and radio links of large UAVs

Source: www.l3t.com

- *The impact of UAS systems on the communication requirements of the next generation (NextGen, Sesar) air traffic control systems:* The communication channels of air traffic control systems currently in operation or being designed are not prepared to meet the increased requirements imposed by UAVs in terms of either capacity or heterogeneity. Research issues also cover the problems related to the accurate prediction of capacity and performance requirements and to the integration of UAVs into the existing, voice-based air traffic control systems.
- *Allocation of a suitable frequency spectrum for UAV control:* For both military and civilian vehicles a redundant and encrypted channel which is protected against interference and capable of preventing unauthorized access to the entire system should be provided. Related research topics include selecting terrestrial radio frequency bands and allocating them in international agreements, standardizing satellite data transmission channels in the same way, and checking availability and vulnerability in a verifiable manner.
- *Determining the power requirements of the telemetry system of UAS control:* Based on communications standards and reliability requirements a scalable systems should be created to ensure that the data connection will be operational between the terrestrial control system and the aerial vehicle even if certain components fail. Another research topic includes development of a clear-cut design methodology that takes reliability into account and determines compliance of the control system with the applicable requirements in regard to systems designed for various uses: such compliance must be demonstrated through a high number of simulations and demo flights. In this context the amount and quality of telemetry data are a key consideration. Research topics also include the determination of what data is absolutely necessary for vehicle control and what data can be regarded simply as a source of extra information.

Airspace use

The second large group includes airspace use, which poses a significant challenge to the representatives of legislation as well as the members of the research community since the common airspace is expansive and the movement of a large number of vehicles is difficult to calculate.

Figure 2

Communication between UAV and other occupants of the airspace

Source: www.nasa.gov/centers/armstrong/news/FactSheets/FS-075-DFRC.html

- Standardization of vehicle separation steps as an integrated separation principle: In its current state, civil aviation has various systems and rules for implementing head-on collision prevention, self-separation and separation management (TCAS, air traffic control, airspace rules), which should be part of a consistent system in regard to UAVs. Another research topic deals with determining the degree of automation for various functions: what tasks can be delegated to the grounds personnel and in which situations the UAVs are expected to make independent decisions.
- *Evaluation of security risks posed by aircraft to the airspace:* A systematic analysis method based on theoretical grounds should be developed for the evaluation of problems arising from faults and failures and their consequences, which takes into account the airspace structure, the risk posed to persons in the vicinity of the incident, and the human-machine control connection. This would make it possible to determine the degree of risk posed by each UAV to human life and property, which would constitute the basis of authorizing flight in the various segments of the airspace.
- *Implementing the "See and Avoid" system:* Aboard every civilian aircraft, the pilot's vision complements the sensors of air traffic control and the aircraft, however, in unmanned aerial vehicles this capability must be substituted with other sensors (camera, radar, radio navigation devices, etc.), and sensor fusion should also be implemented to allow for making consistent decisions. In addition to meeting performance requirements imposed on these systems, the greatest challenge is the satisfactory theoretical demonstration of compliance to the authorities.

Figure 3

Aircraft "Sindy" of HAS ICSC used for performing "see and avoid" tests

Source: uav.sztaki.hu

- *Development of separation algorithms:* Automation of safe separation demands special care as theoretically proven algorithms that are also tailored for efficiency beyond tackling separation should be developed to handle every conceivable situation. It is important to note that these methods should be compatible with the current aviation standards, and the system should behave in an unambiguous and safely predictable way all the time so that an encounter with the vehicle does not confuse pilots or the air traffic control.

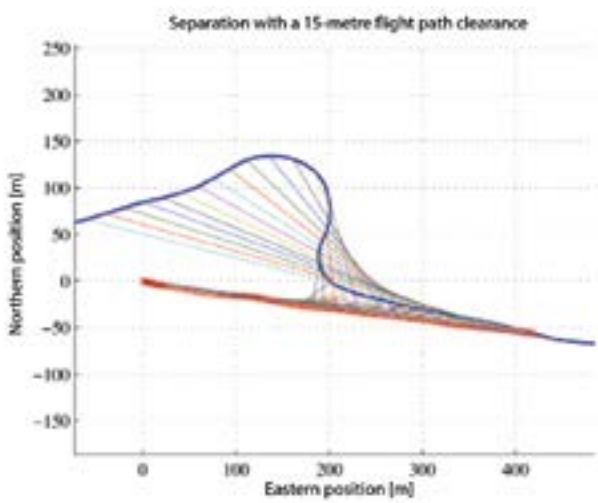

Figure 3

Aircraft "Sindy" of HAD ICSC, testing avoidance manoeuvres designed to achieve sufficient separation: own aircraft (blue), aircraft on collision course (red)

Source: uav.sztaki.hu

On-board systems of the aircraft

The on-board systems of the aircraft and its airframe – the most spectacular element of an UAS – are just components of an entire system, but they still pose serious challenges to research.

- *Aircraft state awareness and real-time mission control:* An aircraft often changes its trajectory and performs a number of different activities during its mission so it is necessary to be aware of its flight state in regard to all mission objectives and possibilities, which allows the vehicle or its operator to determine the upcoming tasks, and in case of malfunctions they can make a responsible decision on aborting mission and respond correctly to emergencies. In this area research involves development of on-board diagnostic and fault detection algorithms which can be used to predict various failure modes or investigate faults and failures that have already occurred.
- *Certification of airframe and avionics system:* Aircraft used in civil aviation are subject to a thorough and expensive procedure in which the aviation authorities attempt to cover every detail to confirm the reliability of the vehicle. However, this expensive and time-consuming procedure is not feasible in the case of UAVs due to the long lead time and the diversity of aerial vehicles. Research is underway in model-based certification procedures that would produce reliability statistics from a minimum number of flight tests, promoting the continued development of UAVs and contributing to the supply of data that are indispensable for their integration into the airspace. In civil aviation a stark distinction is made between hardware and software reliability, but in the case of UAVs, the application of analytical redundancy blurs the lines and, as a result, research in integrated software and hardware certification methods is also a significant task.
- *Supply of precise position and navigation data:* Unmanned aerial vehicles rely heavily on the GNSS global positioning system to establish their current position. In terms of availability this represents a significant problem as they are unable to use alternative methods to determine their position if the GPS/GNSS signals are jammed. There are multiple research projects that aim to develop cost-effective alternative positioning and navigation systems that are based on the fusion of data from multiple sensors. From conventional inertial devices through triangulation methods based on terrestrial wi-fi networks to solutions using visual data and laser scanning, several research areas show promising results.

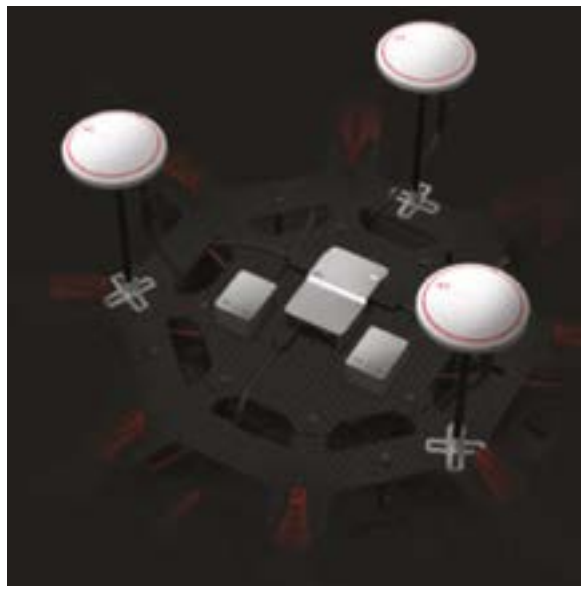

Figure 4
Triple-modular redundant flight control and navigation system available for DJI M600 multi-rotor drone

Source: www.dji.com/d-rtk/info

Human-machine integration

The fourth research area is human-machine integration, which is not exactly an engineering task: human factors and psychological considerations pose a serious challenge to the designers of future UAS systems.

- *Air traffic/airspace information display system:* Adapting UAVs to the familiar air traffic control systems is a serious challenge to air traffic controllers. It is unclear what information they can get and what instructions they can give to these vehicles the manoeuvrability of which is not known to them. Exploring human factors is an important research objective to reduce their workload stemming from the fact that air traffic is increasing and becoming significantly diverse.
- *Designing an efficient human-machine automation interface:* The problem with UAVs is that the ground control staff does not have the situation awareness of a pilot flying an aircraft, so they can only use information available to the ground control centre (GCS) to make decisions. However, the information available in the GCS is not always correct or the system does not provide information in the format that would be the most suitable for the ground controller. There are research projects all over the world that regroup and visualize these bits of information in a way that is the most efficient for the operator. Today it is humans who have the final say in matters of sudden emergencies, however, automated systems offer a wider selection of options to facilitate the process of decision making for the pilot.

Figure 4
UAV operator in a dedicated terrestrial control centre

Source: www.defenseindustrydaily.com/uav-ground-control-solutions-06175/

- *System-level interaction between terrestrial personnel and aerial vehicle:* In the future, a single pilot may control multiple semi-autonomous UAVs and manage high-level tasks for vehicles flying in formation. As a result, developing a user interface and a flow of information that are suitable for taking direct control of a single UAV in an emergency situation, in addition to visualizing and processing its high-level function specific controls is another serious challenge. In this context, handling division of labour between control centres at different geographical locations and implementing efficient and secure information exchange are also serious problems.

Figure 5
Multi-rotor aircraft flying in formation in an experiment conducted by the research team of ELTE Collmot

Source: https://hal.elte.hu/flocking

Conclusion

Unmanned aerial vehicles are a technology that shows considerable progress, and the new areas of applications that spring up every day make research extremely appealing in this field. As start-ups can develop competitive products for a fraction of the costs incurred in civil aviation, research projects may mature much earlier into actual products, which is also significant in regard to the national economy as aviation is traditionally regarded as a high-tech sector. There is significant domestic research and development potential in most of the above mentioned areas and Hungarian researchers produced achievements of global significance in several areas. Once satisfactory legislation is enacted, profit-oriented companies may also appear in the area of research and development, in addition to academic research institutions.

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Water Security in Europe, in the Danube Basin and in Hungary

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Abstract

The past years have seen a growing interest in water security. This paper presents the "working definition" of water security proposed by UN-Water to provide a common framework for collaboration in water management and security across the UN and also Europe.

The main objective of this paper is to provide an outlook on the challenges of water security in Hungary. Hungary is a member of the EU, whose the total area belongs to the Danube Basin. The major water security challenges to be addressed are similar on various levels, such as the EU, the Danube Basin and Hungary. This is why these issues are discussed together on various levels. In addition, the paper also discusses the GWP's "Water Secure World Vision" and the OECD's "Water Security for Better Lives" initiatives with special regard to Europe and Hungary.

The paper offers an overview of the current status and future challenges of European waters, the security of drinking water, outdoor bathing water and ecosystem, flood and drought risk management, critical infrastructure protection, the climate adaptation and sustainable development in Europe and Hungary.

The paper underlines the important role that cooperation plays in addressing water security challenges, including various levels and scales. ICPDR's activity sets a good example for cooperation across the Danube Basin for handling shared challenges of water security.

Water Safety Plans are improved risk management tools designed to ensure the safety of drinking water through the use of a comprehensive risk assessment approach that encompasses all steps in water supply from catchment of the source to the consumer. As a case study, an overview of the status of the water safety planning in Hungary is presented. Finally, the paper also describes the important role of the application of integrated water resources management in addressing water security challenges.

Keywords: water security, drinking water security, water-secure world, integrated water management, river basin management, water scarcity, drought, flood risk management, environmental security, sustainable development goals

Introduction

This paper is aimed at providing an overview of the concept of, and the need for, strengthening water security, as well as the global actions proposed and launched with the aim of achieving an acceptable level of water security. It reviews trends in water security in Hungary during the past decades, what is to be expected during the coming years and decades and what will have to be done in the future to achieve improvements in water security that can be regarded as reasonable and expected by the society.

Water and nutrition security – a global review

Why is it necessary to deal with water security? Water security, crises, conflicts and the like, are being discussed and written about more and more these days. The question is, whether all this is for good reason. To answer this question we will present a simplified overview of the relevant global trends (Somlyódy, 2011), although this study is devoted primarily to matters of relevance to the Danube basin, as well as domestic issues. Existing global trends are making impacts of smaller – regional and local – scales are even more remarkable.

The fundamental question regarding water management is whether the available resources are sufficient for meeting the existing and future demand. The total quantity of water *(Q)* available on Earth is *constant* and very large: about 1400 million km³ (Papp–Kümmel, 1992) – to be compared to the approx. 2 km³ volume of Lake Balaton. Of the total of 1400 million km³ however, only 35 million km³, that is, 2.5%, is freshwater of which, however, only a certain part is available for human societies. Extraction is limited to the dynamic resources that are renewed year after year in the relatively quick water cycle. If that limit is exceeded, the resources undergo a variety of unsustainable changes: the groundwater table sinks, the amount of water stored by lakes decreases and rivers may fail to reach seas. The end result of the process is *waters disappearing.* The most famous/infamous examples include the Aral Sea and Lake Chad, the Colorado River (Postel, 1992) and a multitude of subsurface waters in China, India, Saudi Arabia or the USA.

The renewable resources are a result of a hydrological cycle, an immense distilling process driven by solar energy. The amount of water vapour (steam) making its way into the atmosphere is somewhat more than 400 km³/year (Papp–Kümmel, 1992). However, much of this falls back into the oceans in the form of precipitation. Consequently, the actually

available *renewable* quantity is a result of overland flow, amounting to a mere Q* = 40 000 km³/year.

At a global level, household water consumption equals 10%, while industry uses 20%, with agriculture, the largest water consumer using 70% of the total amount of water used by mankind (UN-Water, 2009). The estimated total per capita water demand is about 600–700 m³/person/year. Checking the indicator from the aspect of demand for food the average per capita water demand appears – according to literature – to be approx. 1000 m³/person/year (WPJ, 2009/2010). The scale of demand for water is clearly illustrated by the high rates of water demand of the key elements of the food basket. The following quantities of water is used for the production of 1 kg of some of the key food products: rice (3000 l), wheat (1500 l), soya (1800 l), chicken (4000 l), beef (16 000 l) and milk (200 l) (Chapagain–Hoekstra, 2004; UN-Water, 2009). Thus it is important to note – and this is our first conclusion – that *the key issue associated with the "water problem" is not household water supply but food security, which itself requires many times as much water.* One prerequisite for food security is water security.

The recognition of the vast quantities of water "built into" various products, directly or indirectly, leads to the concept (similarly to the ecological footprint) of *water footprint (I*).* Water footprint is the volume of water used for the production of a unit quantity of product or in the provision of a unit quantity of a service. The water footprint of a country is calculated on the basis of all of its products and services. The global average water footprint is estimated at present to be about 1240 m³/person/year (UN-Water, 2009). This ratio is highest in the US (2480 m³/person/year, indicating an inconceivable degree of wastefulness), some 700 m³/person/year in China, while in Hungary it is somewhat below the global average. The rounded ratio of 1000 m³/person/year has an additional meaning in practice: this is considered to be the so-called stress threshold below which water management starts to be very difficult *owing to the physical scarcity of the resources*. Water scarcity is sometimes also characterized in terms of the degree to which the resources are utilized (demand/quantity of the available resources: *D/Q*), with 40% being considered as a critical threshold (see below).

Accordingly, the global demand, with 7.5 billion people on the globe, is about 7500 km³/year, to be compared with the Q* = 40,000 km³/year, or the per capita Q* = 5500 m³/person/year to be compared with the I = 1000 m³/person/year ratio. These figures are not very far from each other. The trend is not conducive to optimism either: at the beginning of the 20th century the specific water resource was as great as 27,000 m³/person/year, which (calculating with a total global population of 8.5 billion[1]) may drop to approx. 4700 m³/person/year by year 2035. *Accordingly, rather than the total available resources, the per capita ratio is decreasing as a consequence of the population increase, and at an alarming rate.* The situation is made all the worse by the fact that attempts made at curbing the increase of demand have not been successful so far: the per capita demand has been increasing at twice the rate of the population increase during the past one hundred years.

A variety of marked reducing factors have been appearing on the resources' side. First, some 20% of the renewable resources are to be found in remote areas and are hardly accessible at all – see for example the huge resources of the Amazon River. Secondly, half of the remaining resources – depending on the sizes of watercourses – come with floods and

[1] www.cia.gov/library

monsoons (Mckinney–Schoch, 1996), quickly passing downriver, only a small proportion of which can be utilized by building reservoirs (which are not without their own specific problems). Thirdly, at least 30% of the resources are rendered useless as a consequence of ecological water demand and a variety of pollutions, unless costly water treatment practices are applied. In this way, the renewable, accessible and available quantity *(Q**)* and the demand are as follows: Q** = 2000 m³/person/year and D = 1000 m³/person/year. The $Q^{**} \geq D$ relationship is a crucial prerequisite for sustainability.

The result of the analysis of scale is disconcerting: at a global level the total amount of resources actually available for use is only twice the amount of the total demand. In other words: the degree of utilization is about 50% (with emphasis being laid on scale and trend), which is an extremely high ratio.

Regional variability

Were the available resources of and the demand for water evenly distributed, there would be no reason for being concerned. This, however, is not the case. Water management is characterized by a high degree of variability in space (and time as well), a phenomenon based primarily – besides factors such as population and the level of social and economic development – on the territorial variability of climatic conditions, in terms of evaporation, precipitation, snowfall, snowmelt, floods, dry spells etc. The renewable resources are ultimately determined by precipitation and evaporation, in the context of the water cycle. Precipitation replenishes the aquifers and provides surface run-off and groundwater flows. Evaporation on the other hand (together with transpiration from land vegetation) reduces the water resources available for human use. Both precipitation and evaporation vary heavily from place to place. Egypt, for instance, hardly ever sees rain falling. Runoff maps (UN-Water, 2009) show a conspicuous patch comprising Northern China, South-East Asia, the Middle East and North Africa, along with California and Australia, where the annual runoff is, in many places, only about 10 mm/year. Accordingly, these regions are primarily the areas where water scarcity should be expected to be faced. This is borne out by actual statistics, as these are the areas where the thirty most water-stressed countries of the world (such as Kuwait, the United Arab Emirates, Qatar, Libya, Algeria, Tunisia and Cyprus) are to be found.[2] In the Arab world about 5% of the word population has access to a mere 1% of the resources, with Canada at the other extreme, with only 0.2% of the global population and 20% of the global water resources.

Our question now is: how many people are affected today and how many will be in the future? In the absence of sufficient data we have no reliable answer but what information we have is sufficient for the outlining of existing trends. Kulshreshtha (1993) found that in view of the water resources available in various countries some 4–5% of the total population were living in areas affected by water scarcity. This percentage rate may increase by 2015 to 40–50%, depending on scenario, primarily in the developing world, essentially as a result of population increase and climatic effects. Population growth is expected to account for 70–80% of future water scarcity, while the remaining 20–30% is attributed to climate change.

[2] See: www.nationmaster.com/graph.

Unfavourable changes are also expected to take place in demand for water, as more and more water will be used for irrigation in response to rising temperatures. The structure of demand may change through urbanization, migration and the expansion of the global middle class where enabled by economic growth. Trends indicated by data from other sources are quite disconcerting. According to UN-Water (2009) *water stress* is and will be growing nearly all over the planet. According to the CIA database[3] the number of those affected will, by 2035, very likely rise to 1 billion, if only through population growth. The specific resources of critical countries (see above) may drop by 20–30% between 2010 and 2035.

According to the GWP/OECD Task Force on Water Security and Sustainable Growth some 3.9 billion people are expected to be facing severe water stress in 2050 as a consequence of a chronic global water scarcity. The bleak outlook makes efforts at strengthening water security crucially important even in areas other than those referred to above (Sadoff et al., 2015). The likely impacts of climate change are difficult to forecast but it is concluded from the task force report that climate change may drive under-nourishment up by 25% by 2080, unless steps are taken to enhance water security.

Another conclusion is that water scarcity caused primarily by population growth, the disappearing of waters and other problems are affecting a significant proportion of the global population, primarily in the developing world. The trends are definitely negative. Problems are likely to grow worse and interact with other issues in the future (Somlyódy, 2008). Some of the most relevant issues include urbanization, lack of safe and reliable water supply and sanitation, pollution and contamination, coming in surprising forms (including micro and nano pollution), water quality issues, weather extremes and phenomena driven by climate change (floods, droughts), and, finally, potential conflicts on international waters (half of the global population live in such so-called shared river basins).

Combining the above two conclusions: population growth and the trend of development are gradually eroding water and nutrition security. This then may lead to the outburst of crises, hinder growth and development in ways not foreseeable and, ultimately, trigger major sustainability disorders. Accordingly, the management of water security is, in this aspect, one of the most crucial issues to be dealt with in the future.

Other important aspects of water security

Without preventive actions the most severe forms of damage resulting from the materialization of risks relating to water may be caused by inadequate levels and standards of water supply and sanitation. The WHO's estimate of the average amount of such damage is about USD 260 billion a year. Gastrointestinal diseases caused by drinking water of inadequate quality lead to the premature death of 1.4 million people in 2010 (Sadoff et al., 2015). Inadequate drinking water and sanitation will continue to be the biggest threat facing people.

A total of 665,000 people died between 1991 and 2000 all over the world in more than 2500 natural disasters, some 90% of which were related to water (UN-Water, 2013). A global risk analysis carried out by the GWP–OECD task force (Sadoff et al., 2015) shows that the total amount of economic damage caused by coastal and river floods is about USD 120

[3] www.cia.gov/library

billion a year today. The risk of damage by coastal floods and the risk of damage by river floods is expected to quadruple and double by 2030, respectively. The average amount of damage that may be caused by river floods all over the world increased from an estimated USD 7 billion in the 1980s to USD 24 billion by 2001–2011. The risk of floods will continue to grow due to population growth and the increase in the value of economic assets threatened, as well as owing to the likely effects of climate change (Sadoff et al., 2015). These estimates highlight the importance of focusing efforts on the situation of, and the possibilities of increasing, water security.

According to a more recent estimate of the OECD Environmental Outlook project (OECD, 2013a) amount of water used globally will increase by 55% by year 2050 and some 40% of the world's population will live in water stressed areas. Things will be made even worse by the deterioration of the quality of water resources. The world's population is expected to increase to about 9 billion by 2050. This will entail an increase in the demand for water, food and energy, along with the impacts jeopardising the state of the environment. These processes will weaken water security, which bound to be further eroded by climate change up to 2050, depending on what regulatory measures and actions may be taken in the meantime.

The future vision of water management differs remarkably between developing and economically developed countries. This difference is analyzed in detail by an OECD report (OECD, 2013a). The conclusions concerning the differences between OECD and non-OECD countries apply to the situation of Europe, including Hungary. According to most recent estimates the annual demand for water in OECD countries is expected to decrease (from the estimated 1000 km^3 in 2000 to 900 km^3 in 2050). Of the non-OECD countries the annual demand for water in the BRIICS countries (Brazil, Russia, India, Indonesia, China and South-Africa) is expected to grow from 1900 km^3 in 2000 to 3200 km^3 in 2050. In other non-OECD countries the rates of growth will be different from the above: the annual demand may increase from the 700 km^3 in 2000 to 1300 km^3 in 2050.

Another major difference between countries is that nutrient loads from point and non-point sources will grow significantly faster in non-OECD countries than in the OECD countries. Non-point pollution, seasonal and local water scarcity and floods will, however, pose major challenges in OECD countries as well in the future. The infrastructure required for acceptable water security is far less well developed and resources are also far less abundant in developing (non-OECD) countries, than in developed countries. There is a need for infrastructure development in the majority of the OECD countries as well (including reconstruction of ageing infrastructure elements) but their priorities are different from those of developing countries.

A total of 276 major international river basins have been identified across the world, taking up nearly half of the Earth's landmass. The areas of 148 countries cover one or more cross-border river basins. There are 39 countries with more than 90% of their respective territories to be found in one or more cross-border river basins. There are 21 countries having the whole of their respective territories in one or more cross-border river basins. Hungary is an example of the last category, with the whole of its territory in the Danube River Basin. In countries sharing river basins water security is usually largely affected by the hydrological situation that has come about and the activities being carried out in the

other countries sharing the same river basin. In response to this recognition the UN-Water (2013) introduced the concept of *cross-border water security*.

On the whole, the global water situation is more than disconcerting and the prevailing trends are unfavourable. This conclusion is even more apt in view of regional variability and its indicators. It is therefore necessary to carry out an analysis of water security and to integrate it in decision making processes at different levels.

Why does water security need to be analyzed in Europe, in the Danube River Basin and in Hungary together? The past two decades have produced a significant number of positive results in domestic water management: Hungary's preparations for EU membership, then its actual membership and cooperation with countries sharing the Danube River Basin may be viewed as the most important changes. This trend is highly likely to continue in the coming decades as well. The member states of the European Union must provide for the protection of human life, health and the state of the aquatic environment on the basis of a set of harmonized principles, in accordance with the Water Framework Directive and the related body of water protection legislation. Hungary is situated in the Danube River Basin. Many of the factors affecting water security can only be influenced in the whole of the Danube River Basin, by joint action on the part of countries sharing the river basin. This is why work on increasing cross-border water security (UN-Water, 2013) is so important for us.

The world will have to tackle major water management challenges during the coming decades (Somlyódy, 2011; Sadoff et al., 2015). Such major challenges include the diminishing of specific water resources, disappearing waters, physical and economic water scarcity, urbanization, climate change, drinking water supply and sanitation, water pollution, conflicts in and over shared river basins etc., along with the fact that these issues often appear in mutual interaction, aggravating the situation in existing crisis zones or creating new ones.

Water is an essential element of human life, welfare, economic development and good status of flora and fauna that are dependent on water. The great water management challenges facing the world cannot be tackled and sustainable development goals cannot be accomplished without satisfying water-related needs to a degree of security that is acceptable to society. Society expects its reasonable and justified demand for water to be satisfied to a high level of security. Complete security however, does not exist; a social consensus should be reached in regard to an accepted level of water security. The term "water security" is construed in a variety of ways. The resulting misunderstandings may be avoided by defining – as part of a given study or research – what is to be understood as water security for the given purposes. This is what we do in this paper when we apply the definition adopted by UN-Water (2013) (see below).

One question that may arise is what new is there in discussing the "water issue" from the perspective of security. The most important factors may include the innovation that lies emphasis on uncertainties and risks relating to the possibility of satisfying needs for water and on impacts of the risks concerned, along with our seeking, with the involvement of society in general, to identify a level of security that is acceptable to society and that is feasible from an economic and environmental aspect. Neither Europe as a whole, nor Hungary alone, can afford to refrain from participating in water management, climate change adaptation, sustainability and other major programmes that are currently under way at a global level (Shah, 2016). At the same time, it would be amiss to refuse to take into account the differences that are to be found between and among continents, countries and regions.

For this reason, global water security programmes and their relations with European strategies will also be noted in this paper.

Water management satisfying the needs of society, the economy and the environment in an acceptable way is no longer possible without the adoption of an integrated approach encompassing an entire river basin. Applying such an approach plays a fundamental role in creating water security, something that has certain special characteristics in Europe. This paper is closed by a summary of the key issues relating to its subject, including conclusions drawn from our own research.

A working definition of water security, efforts made towards realising the vision of a "water-secure world"

The importance of enhancing water security has been emphasized, interpretations of the concept of water security have been worked out, global water security programmes have been recommended and proposals for the implementation of such recommendations have been made at a variety of important international and global forums. Mention should be made, for example of OECD's volume of studies, entitled *Water Security for Better Lives* (OECD, 2013a; 2013b), Water Security & the Global Water Agenda (UN-Water, 2013), as well as UN-Water activities aimed at redefining the Sustainable development goals (Shah, 2016). Hungary is actively participating in the latter (GWP Magyarország, 2016). One of the recently completed documents, recommended by GWP – setting out, among other things, some of the key elements of the initiatives made so far – entitled *Strategy a water-secure world* (GWP, 2014), worked out the vision of what is referred to as a "water-secure world." The most recent, scientifically-founded document discussing the relationship between water security and sustainable growth, is a report produced by the GWP-OECD Task Force on Water Security and Sustainable Growth (Sadoff et al., 2015). In the following sections we review activities undertaken at a global scale towards water security.

The concept and key issues of water security

Water security is interpreted in many ways and a wide variety of technical and scientific publications have come up with proposals for a definition of the concept. Definitions in broader and narrower senses have equally been put forward. In its narrowest sense water management is restricted to drinking water security, while the broadest proposed interpretation encompasses the security of the satisfaction of nearly all needs relating to water management. The UNO has, for instance, been dealing frequently and extensively with water security as one of the key prerequisites for global peace (Cosgrove, 2003). The currently most widely accepted working definition was elaborated by UN-Water, the body coordinating the activities of the UN organizations and institutions dealing with matters and issues of water management (UN-Water, 2013: 1.):

Water security means "the capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being, and socio-economic development, for ensuring protection against water-borne

pollution and water-related disasters, and for preserving ecosystems in a climate of peace and political stability."

This paper construes the concept of water security in accordance with the above definition. Shared interpretation of the concept is indispensable for effective international dialogue and action. UN-Water (2013) highlighted five key policy-type issues pertaining to water security:

- water security and human rights,
- the role of water security in social and economic development,
- water, food and energy security,
- climate change and water security,
- the role of ecosystems in creating water security.

UN-Water proposed that the use of three water policy instruments be assessed with the aim of creating water security:

- answering water security challenges,
- capacity building towards creating water security,
- development of water administration to promote water security.

This is the most recent and most important document on tackling water security challenges at a global scale at present. It discusses key issues of relevance to creating acceptable water security, together with the possible instruments for dealing with those issues. Europe, and Hungary alike, must by all means facilitate the creation of water security all over the world. At the same time, there is a need for analyses as to how the UN-Water's conclusions should be understood in Europe and in Hungary. Priorities that befit our own circumstances need to be established, together with key areas of a regional and country relevance.

Strategy for a water-secure world (2014–2020), proposed by the GWP

After thorough preparations the GWP formulated three strategic objectives (GWP, 2014). Making efforts towards accomplishing them may help countries in improving their water governance and water management and in the realization of the vision of a world of water security.

Goal 1: altering the policies and the practice of water management,
Goal 2: creating and spreading a knowledge base,
Goal 3: strengthening cooperation.

The most important activities to be carried out towards realising the vision of a world of water security must, according to the strategy, belong to the following six key areas:

- climate change adaptation and water security,
- international (cross-border) water security,
- food and water security,
- energy and water security,
- urbanization and water security,
- ecological systems and water security.

Realization of the vision worked out by the GWP is in the very best interests of the countries of Europe as well. It is also a moral obligation for Europe to help developing countries in achieving their water security objectives, which are, for the most part, different from those of the European countries. Attaining water, food and other related security goals may be one of the key instruments for preventing migration processes of the type being witnessed today.

The role of water security in attaining the SDG6 sustainable development goal

In 2013 the UN Economic and Social Council adopted the *Post-2015 Development Agenda.* A total of 17 *Sustainable Development Goals – (SDG)* were worked out on the basis of the agenda. The sixth of the goals is referred to as the water management goal, *(SDG6* – Ensure availability and sustainable management of water and sanitation for all), and the rest of the goals also include some whose accomplishment requires integration with water management (e.g. SDG11.5 Water-related disasters).

SDG6 comprises 6 targets. The prerequisites for the attainment of each target include the creation of an acceptable level of water security: the prescribed water security, a satisfactory level of equitable sanitation, water quality meeting the requirements, water scarcity management of an acceptable level, integrated water management (including international cooperation in the shared river basins) and ensuring a good status of aquatic ecosystems (Shah, 2016; GWP Magyarország, 2016). Although the important role of water security in the accomplishment of the SDG6 targets is emphasized at a variety of forums, nonetheless, the enhancement of flood security is not included in the description of any of the SDG6 targets (GWP Magyarország, 2016). Nor is flood security included in a number of major documents on water security (e.g. GWP, 2012; 2014). At the same time, the main document setting out the working definition of the term water security and the one laying down the foundations for global actions – the UN-Water recommendation (2013) and the report of the GWP-OECD Task Force on Water Security and Sustainable Growth (Sadoff et al., 2015), deal with flood security as one of the key requisites for water security.

The GWP-OECD report looks at water security from the perspective of risks and describes it with four factors or indicators: water scarcity, floods, inadequate water supply and sanitation and deterioration of the state, and pollution, of ecosystems. The report points out that the first two of the above factors result primarily from hydrological variability, while the other two are caused by human activities, noting at the same time, that each of the four factors are closely connected with the others.

It was with the aim of promoting the accomplishment of SDG6 that the UN and the World Bank set up a High Level Panel on Water. The ten members of the panel are heads of state and prime ministers highly committed to the management of water-related challenges, including Hungary's President János Áder. This panel is expected to coordinate global actions towards enhancing water security. The fact that Hungary is represented by its President may facilitate Hungary's contribution to the accomplishment of the vision of a water-secure world.

Water security for better lives

The issue of water security were analyzed by OECD experts under the motto of "better policies for better lives" (OECD, 2013a; 2013b). They scrutinized the role of water security and the possibilities of achieving it primarily from the perspective of the economically more advanced OECD countries, but they also discussed water security challenges facing non-OECD countries.

An OECD report (2013a; 2013b) claims that the accomplishment of the water security objectives means that four types of risks are kept at adequate levels:

- the risk of water scarcity (including drought),
- the risk of inadequate water quality,
- the risk of too much water (including floods),
- the risk of irreversible changes in the hydraulic and biological functions of surface and groundwater bodies.

Of the four types of risks the first and third ones are readily compatible with the four areas of water security as highlighted in the report produced by the GWP-OECD Task Force on Water Security and Sustainable Growth (Sadoff et al., 2015). The other two however, are different in this aspect. This is why both approaches are worth studying in depth; it may help us in drawing important lessons for use in enhancing Hungary's national water security.

According to the report (OECD 2013a; 2013b) the four types of risks should be examined in an integrated way, as mitigating one risk may result in aggravating another (reducing the risk of water scarcity by irrigation may, for instance, increase the risk of deterioration of the status of water-dependent ecosystems). One of the most profound functions of water management is concerted management of such risks. Failing to carry out the latter, or to carry it out properly, may lead to extreme damage (droughts, floods, diseases etc.). Creating water security of a level acceptable to society is impeded in many cases by the lack of knowledge of the risks.

The report of the GWP-OECD task force (Sadoff et al., 2015) points out that the levels of water security are higher in more developed countries: most of these countries have better means for creating and maintaining water security at acceptable levels. The report also notes however, that water security poses major challenges for both developed and developing countries. It is also emphasized in the report that the creation of water security of an acceptable level is not a static goal; it changes dynamically, as a consequence of climate change, economic growth and the decrease of the quantity and deterioration of the status of the available water resources. The water security objective is also influenced by changes in social, cultural and aesthetic priorities and values.

Water security may only be achieved though collaboration involving experts of a variety of fields and disciplines relating to water management. The tasks of creating global water security are discussed from an engineering perspective in the report prepared by the Steering Group on Global Water Security of the Royal Academy of Engineering (Royal Academy of Engineering, 2010). The report contains a number of recommendations that are worth taking into consideration in national water security programmes. For example:

- In international trade negotiations account must be taken of products' water footprint (see above), and their virtual water content, to promote actions against increasing water stress.
- Optimally balanced national policies should be worked out, with a view to considerations of water, food and energy security.
- The water footprints of local production processes should be reduced in order to promote global water security.

Water security in Europe: tasks of creating a "water-secure Europe"

Many are of the opinion that the implementation of the regulations of the Water Framework Directive is in progress, therefore everything is all right in regard to the situation and future of water management in Europe. This is just a first impression. EEA's complex analyses however, show that there are still a number of problems that will take major efforts to resolve. To name but a few, there are the much-discussed floods and droughts that are (may be) profoundly affected by climate change, which may trigger unexpected occurrences and substantially change their territorial distribution and extent. In many places, primarily in Southern Europe, demand for water for use in irrigation is on the increase; this leads to sinking groundwater tables and an influx of salty seawater, often necessitating the introduction of membrane technology. The price of water rises unfavourably in many cases, together with the ratio of extraction, agricultural non-point pollution, P and N loads, the orthophosphate concentration of rivers, as well as the emission of certain heavy metals. Regional problems – Black Sea, Baltic Sea – demand continued and consistent efforts; the vision of a Europe of water safety will not be easy to realize.

The status of European waters in 2012

2012 was the Year of Water in Europe In the context of the campaigns and actions launched during the year the European Commission published what is called the *Blueprint to safeguard European waters*, hereinafter: *Blueprint)* (EC, 2012c). It contains a revision of the first river basin management plan prepared pursuant to the regulations laid down in the Water Framework Directive, the European water scarcity and drought policy, and water management related considerations of climate change adaptation and of vulnerability.

To supplement the Blueprint, and by way of background materials, the European Environmental Agency (EEA) has published six reports on the status of European waters:

- Towards efficient use of water resources in Europe
- European bathing water quality, annual report, 2015,
- Territorial cohesion and water management in Europe
- Water resources in Europe in the context of vulnerability
- European waters – assessment of status and pressures
- Report on the status of European coastal waters

In addition to the above, the EEA prepared three more reports:

- Adaptation of cities to climate change in Europe
- Environmental indicator report – 2012
- Climate change, impacts and vulnerability in Europe – 2012

The results of the nine report were summed up in a synthesising report (EEA 2012b), *providing an unprecedented, integrated overview of the status of European waters, making it one of the most important basic documents of European water security.* The immense (though, according to the authors, still insufficient) amount of information presented and referenced in the report shows that the status of European waters had improved less than expected. This may be partly a result of the "one bad – all bad" principle applied in the assessment of the status of waters. The underlying reason is that the status of a water body is rated on the basis of more than twenty factors, and if the status of the water body is not good in terms of even only one of them, the integrated status of the water body cannot be rated good. Consequently, although in many cases a variety of massive and costly actions have been taken to improve the status of waters, resulting in significant improvements in terms of various specific factors and probably in water security as well, these improvements are not reflected by the reports on the changes in the statuses of waters. One of the key messages of the EEA report (2012b) was that such a European water policy is required that would ensure effective utilisation of water resources (satisfying the water management related needs of society and the economy, acceptable security of water supply) and the protection of aquatic ecosystems (the water security of ecosystems) as well.

The implementation of the provision of the Water Framework Directive may perhaps be the world's largest environmental programme. As a unique achievement of the European Union the *first river basin management plans have been prepared on the basis of harmonized principles* for the entire area of the EU and the European countries that have jointed the programme. In the plans the member states worked out action programmes required for improving the statuses of 13,000 underground and 125,000 surface water bodies to a "good" level and for keeping up their good statuses. The implementation of the planned actions is envisaged to create in the EU member states the drinking water, outdoor bathing water and aquatic ecosystem security of the levels they have jointly determined, by the end of year 2027 at the latest.

The first river basin management plans showed that the ecological statuses of more than 50% of the European surface waters were rated worse than the at least "good" status prescribed as a minimum requirement in the Water Framework Directive (EEA, 2012a; 2012b). However, only 10% of the surface waters whose chemical statuses were known, belonged to categories worse than "good". The statuses groundwaters were found to be better than those of surface waters; the statuses of more than 90% of groundwaters were good in terms of both quantity and quality. *The statuses (or potentials) of more than 51,000 water bodies (56% of the identified water bodies) or 630,000 km of watercourses (64% of the total length of all watercourses) were worse than good.*

The EEA synthesis report found that European countries will reach water quality levels required for reaching the good ecological status within 10-15 years once the provisions of the directive on municipal waste water treatment are fully complied with. It is not likely however, that the nitrogen content of surface waters, originating from non-point sources,

will meet the requirements of the good ecological status within 10-15 years, if the prevailing trend continues unchanged. For this reason, additional actions had to be planned in the second river basin management plan for reducing non-point source stresses. *The picture of the situation, the trends and the conclusions disclosed in the EEA synthesis report and the attached part-reports show that there is still quite a lot to do towards creating water security at acceptable levels.* The necessary statutory guidelines, methodologies and plans are available for this.

Protection and security of outdoor bathing waters in Europe

Primarily as a consequence of the development of sewage networks and the improvement of the effectiveness of wastewater treatment plants today the *quality of outdoor bathing waters is better in most places in the EU than 30 years ago* (EEA, 2016b). By 2015 the quality of water at 96% of the monitored bathing sites was up to the prescribed minimum requirements. Some 83% of the bathing sites had excellent water quality. Accordingly *water security at the outdoor bathing sites is adequate at present.* This level is likely to be kept up during the coming decades as well, owing to the increasing weight of tourism in the respective national economies and the interest representing capabilities of the representatives of tourism. This is made all the more likely by the fact that a number of non-EU countries also undertook to observe the strict guidelines of the European Union. The improving trend is indicated by the fact that the phosphorus pollution of watercourses dropped by 54 %, while that of lakes decreased by 31% between 1990 and 2010 (EEA, 2012b).

Drinking water security in Europe

Particular emphasis is laid in the European Union on achieving drinking water security. The Water Framework Directive provides that all waters that are used – or are planned to be used in the long term – for human consumption, must be regarded as protected areas. These waters are protected primarily by the provisions of the Water Framework Directive, the nitrates directive and the municipal waste water directive, along with a number of other EU directives (including the EIA directive, the SEA directive, the directive on public participation) (EU CIS, 2007) and national legislation. The EU member states *have identified more than 78,000 drinking water protection areas* where the status of water resources is protected by particularly strict regulations. In fifteen EU member states groundwaters are the main source of drinking water supply, while in nine member states most drinking water comes from surface waters. The ratio of groundwaters varies between 16% (Ireland) and 100% (Austria, Denmark and Lithuania).

Ecosystem security in Europe – Natura 2000 areas

The EU bird protection directive provides for the preservation of 193 wild birds species and sub-species, while the habitat protection directive secures the protection of 1250 species,

sub-species and 233 habitat types. Some 18% of the total area of the European Union is covered by Natura 2000 sites, making up the world's largest network of nature conservation areas, managed under a harmonized system of regulations. The EU 2020 biodiversity strategy plays a key role in creating ecosystem security. According to the report on the implementation of the provisions of the bird protection directive some 54% of all protected birds are safe in Europe (EEA, 2015). According to the habitat protection directive some 23% of the biogeographic habitats are in adequate statuses, but the statuses of more than half of them are below this level. The statuses of 26% of the habitats below adequate are improving, while the statuses of 22% of the same category are deteriorating.

The security of aquatic ecosystems is considered as one of the key factors of water security by the most important documents on water security, such as the report prepared by the GWP-OECD Task Force on Water Security and Sustainable Growth (Sadoff et al., 2015). The enhancement of the security of aquatic ecosystems is facilitated by the European Commission through its "good practice" guides, prepared with the participation of member states' experts (e.g. EC, 2009; 2012a).

Water and food security – the water footprint of food waste

According to the summary report on the FAO's investigations about a third of the total amount of food produced globally is wasted each year (Hoekstra-Mekkonen, 2012; FAO, 2013). The amount of food wasted could feed as many as 2 billion people. The "blue" water footprint of the production of an amount of food equalling the total amount wasted each year (that is, the quantity of surface and groundwater used in producing it) is approx. 250 km^3/year. This amount of water is, according to the FAO (2013), more or less equal to the quantity of water carried by the Volga River in an average year, or three times the amount of water in Lake Geneva. To provide a domestic example: this twice the amount of water flowing down in the Danube River at Budapest in a year. It would take 1.4 billion hectares, or about 30% of the total land used all over the world for agricultural production, to produce the amount of food that is wasted globally each year. FAO estimates that the cost of producing the amount of food wasted each year is approx. USD 750 billion.

Europe's food wastage makes up – according to the FAO report – some 16% of the global wastage, the production of which takes an amount of water equalling 7% of the global blue water footprint (19 km^3). According to the report (FAO, 2013), the reason why a smaller amount of water would be required for making up for the loss in Europe because composition of the food wastage differs from that of other regions of the world. It would take about 100 million hectares of land to produce the total quantity of food products wasted year after year; half of it arable lands, the other half used for purposes other than agricultural production. The average blue water footprint of food wastage is 38 m^3/person/year globally (this is how much water would be required for producing food equalling the per capita wastage on an average). The average blue water footprint of the food wastage is 26 m^3/person/year in Europe, it is the highest (92 m^3/person/year), in North Africa and in West and Central Asia, and the smallest (13 m^3/person/year) in the Sub-Saharan Africa.

The amount of food wasted in Hungary in year 2010 was 175 kg/person. The wastage was lowest in Romania (76 kg/person) and it was highest in the Netherlands (541 kg/person).

It is clear from the above data that *reducing food wastage all over the world – including Hungary – may be an important means for reducing the amount of water used, and thus for the enhancement of water and food security, as well as, indirectly of energy security.*

The quantitative status of waters

The EEA's integrated synthesis report on the status of waters (EEA, 2012b) discusses not only the quantitative status of water that is necessary from an ecological perspective, but also its quantitative status from the aspect of water uses and water damage, including risks of floods, droughts and water scarcity as well. The statement in the report, that the assessment of the quantitative status of waters cannot, in general, be based solely on monitoring performed and databases created on the basis of the WFD and other EU directives that have to do with the protection of waters, is a self-evident proposition which is, however, not always taken into account in practice. Assessment is influenced by water uses, water damage response actions, the water carrying and drainage capabilities required for the management of water resources, the water resources that are available for utilization, water yields, water depths, hydromorphological features and other factors.

In view of the quantitative status of waters it seems likely that no water scarcity and resulting food shortages – of a severity leading to famine – need to be expected to develop in Europe during the coming decades. Restrictions due to water scarcity and unusual extreme situations may, however, occur increasingly frequently.

Flood security – is it important to enhance it in Europe?

The unprecedented database on the impacts and effects of floods in Europe since 1980 is an important product of the assessments prescribed by the EU flood directive *(Directive on the assessment and management of flood risks)* and of collaboration among European countries in water management, (EC, 2015a; 2015b; 2015c; EEA, 2016a). Based on information collected in order to enable the application of the flood directive, the relevant global databases and questionnaire based surveys the European Environmental Agency *(EEA)* has worked out a review of the floods that occurred during the period between 1980 and 2010, together with their social, economic and environmental effects. This was supplemented by the latest report on European floods (EEA, 2016a). These reports contain the latest data and information on Europe's flood security.

Floods in Europe

The latest report released by the European Environmental Agency (EEA, 2016a) reveals that – according to data supplied by 37 European countries – more than 3500 separate flood phenomena occurred in Europe between 1980 and 2010. There were 325 severe floods in watercourses after 1980, more than 200 of which occurred after 2000.

In year 2010 27 European countries were affected by a total of 321 floods (EEA, 2016a). In Poland, floods caused the deaths of more than 20 people, inundating 3400 km^2 of land, causing more than 2 billion euros worth of damage. Extremely severe floods raged in 2013 in Central Europe, in the Elbe and Danube River Basins. In many places the all-time record flood levels were recorded. The total flood-related cost along the entire length of the Danube River was estimated to equal 2.4 billion euros in 2014, including damage caused to property, other tangible losses caused by floods, as well as the cost of flood protection actions. In Austria the flood in 2013 was similar to the great flood of 2002. Nonetheless, the damage – thanks to the developments implemented after 2002 – was worth only 870 million euros in 2013, that is, over 2 billion euros less than the total damage of 3.2. billion euros estimated in 2002 (ICPDR, 2014a).

Year 2014 saw severe floods in South-Eastern and Central Europe (e.g. in the valley of the Sava River). The heaviest losses and damage were suffered in Serbia and in Bosnia and Herzegovina. More than 50 people were killed in Serbia alone, where about 32,000 people had to be evacuated with another 1.5 million residents being affected by occurrences associated with the floods.

The EEA reports draw attention to the fact that the methodologies underlying the flood reports are not harmonized, therefore a measure of prudence is needed in drawing conclusions from information on trends. Nonetheless, the EEA reports contain a number of important findings and conclusions, indicating that *enhancing flood security is one of the most important water management challenges facing Europe.* The reports deal primarily with the environmental effects of floods and flood protection actions. They also point out however, that *there is a need for integrated flood risk management practices, which necessitates the* combination *of economic, health and cultural considerations with environmental aspects.*

Shrinking floodplains in Europe

Nearly a total of 90% of floodplains along rivers have disappeared in Europe, or they are not functioning the way they used to (EEA, 2016a). This ecosystem loss is aggravated by the fact that only about 10% of all European floodplain woodlands have remained in place, mostly in the floodplains of the great Eastern European rivers. The losses of woodlands in the floodplains along the various segments of the Danube River ranges between 73% and 95%, but it is as low as 30% in the Danube Delta. With the tributaries also taken into account, the rate of the loss of floodplain woodlands equals 80% (EEA, 2016a).

Of the European countries the largest number of people live in areas threatened by floods in Italy (6.7 million people, or 11% of the total population of the country). *It is Hungary, however, where the highest percentage of the total population* live in floodplain areas. A key role is played in Europe in the efforts towards flood security by the EU directive on the assessment and management of flood risks, which entered into force in 2007 (2007/60/EC, *Floods Directive*. The completion of the tasks prescribed by the directive may create flood security of a level that is expected by the population across the whole of the area of the European Union.

The European Commission prepared a review of the preliminary flood risk assessment reports submitted by the member states in accordance with the provisions of the flood direc-

tive (EC, 2015b). 23 member states identified a total of 48,000 areas as *Areas of Potentially Significant Flood Risk (APSFR)* in the reports submitted to the EC. Most of the APSFRs (91%) are associated with river floods and only 0.3% are linked with groundwaters. *The largest number of the areas of potentially significant flood risks were reported by Croatia (2,976 areas), while the smallest number of such areas were reported by Hungary (2 areas).* The great difference above is also an indication of the fact that prudence must be exercised in using statistics of EU-level reports, because Hungary obviously regarded the flood protection system of the entire Tisza and Danube valley as a single area of potentially significant flood risks because risks can only be managed in an integrated system across the whole of the area concerned (thereby raising flood safety to an acceptable level). The "large number" reported by Croatia does not mean that flood risk management is a more significant issue in Croatia than it is in Hungary.

The recurrence time (and probability) of floods taken into account in the management of flood risks varies by member state: 5, 10, 2, 50, 100, 200 and 1000 years. Similarly to Hungary, most member states are applying "combined" methods (EC, 2015b), in that the recurrence time (the level of flood security to be attained) is determined subject to the number of people living as well as the economic and cultural values to be found in flood plains.

For example, the flood protection system of Amsterdam affords protection against floods occurring once every 10,000 years, the flood protection systems of London and Shanghai provide protection against floods occurring once every 1000 years, while that of New York only protects the city from being inundated by floods occurring once every 100 years. It was not until after Hurricane Sandy hit the region in 2013 that the idea of upgrading the flood protection system of New York City began to be dealt with (OECD, 2013a). The acceptable levels of water security are determined in a similar way in other areas of water security as well. For instance, the drinking water supply system of a city is recommended to be constructed in such a way that it can meet demand in terms of quantity in 95 of every 100 years, while the quality of the water should meet the requirements in 99 of every 100 years. Vulnerable horticultural plants needs for irrigation is recommended to be met in 9 of every 10 years, while that of less vulnerable field crops is recommended to be met in only 1 of every 2 years (OECD, 2013a).

Do we need to do anything in Europe to increase flood security? What are the scales of flood damage that should be expected in 2050 and in 2080? According to an EEA report (EEA, 2016a) *flood damage may increase in Europe to five times of today's levels by 2050 and to 17 times of the same by 2080.* Some 70–90% of the increase may be a result of social and economic development and growth (increase in the number of people living, and in the economic and cultural values to be found, in floodplains), while the remaining 10–30% may be caused by climate change. Despite the high degree of uncertainty of the estimates the above figures should be taken as a serious warning. They underscore the importance of enhancing flood security and of the implementation of the flood risk management plans, as well as the need for the same from an economic and cultural aspect.

Drought security – is water scarcity and drought management a crucial issue in Europe?

The management of water scarcity and droughts have been among the most serious challenges for centuries in certain parts of Europe, and the situation has, in this regard become even more challenging, primarily as a consequence of the climate change (Demuth, 2009; EEA, 2012b; 2012c; 2012d; Lavaysse, 2015).

Year 2003 brought severe droughts in Europe, affecting *more than 100 million people and a third of the total area of the European Union, entailing costs amounting to 8.7 billion euros in total.* It was in response to this that the European Commission began to work on a water scarcity and drought management policy for Europe (Euraqua, 2004). It was in order to tackle the challenge that the Commission submitted in 2007 its proposal comprising, as its key element, a set of "policy actions" (that is, structural and non-structural methods) recommended to be taken to reduce and prevent damage by water scarcity and drought [COM(2007) 414 finalized]. The status of the implementation of the proposed actions was assessed in "follow-up reports" in 2008, 2009 and 2010. The European water scarcity and drought policy was reviewed in 2012 (EC, 2012b).

At the time of the submission of the Commission's proposal in 2007 some 11% of the total population and 17% of the total area of the EU were affected by water scarcity. The situation has grown worse in the meantime. The extent of the aggravation of the situation may be concluded from the fact that the number of European river basins facing water scarcity in the summer or even during the whole of the year may – as modelled in the context of the ClimWatAdapt project – increase by up to 50% over the coming decades.

Much of Southern and Western Europe, indeed, even Northern Europe, was hit by droughts in 2011 as well as in 2012. *The drought in 2011 was called the most severe drought of the century*, as the total precipitation was a mere 40% of the usual amount. The available water resources decreased significantly in the spring of both of those years, in response to which limits were imposed on water use in much of the EU. The number of droughts and their effects increased dramatically in Europe during the past 30 years. The size of the areas and the number of people affected by droughts increased by nearly 20% between 1976 and 2006, and the damage caused by droughts amounted to a total of 100 billion euros. The number of countries affected by droughts increased in each decade. Droughts affected 15 countries between 1976 and 1980, 17 countries between 1981 and 1990, 24 between 1991 and 2000 and 28 between 2001 and 2011 (EEA, 2012b).

Droughts and water scarcity alike may cause economic losses in all of the key sectors using water, and they can cause negative and harmful economic impacts on biodiversity and the quality of waters. They can erode the statuses of wetlands, they can cause them to disappear, and they can lead to soil erosion, soil degradation and desertification. Some of the effects are limited to short periods and the circumstances quickly return to normal, some effects however, may become permanent.

It is with a degree of self-irony that a Communication from the European Commission (EC, 2012b) notes a large number of mutually related shortcomings in the policies in place for the management of water scarcity and droughts in Europe. The Communication criticizes the fact that the river basin management plans worked out on the basis of the Water Framework Directive contain insufficient data on current and future demand for water, the

available water resources, the actions taken to manage water scarcity and droughts as well as on the expected impacts of the actions on water scarcity and drought. These deficiencies cannot, however, be regarded as defects in the river basin management plans because the *Water Framework Directive and the river basin management plans are not aimed at satisfying the society's and the economy's water-related requirements or at planning actions to provide for their satisfaction.* Such actions must be planned in separate drought management plans – similar to flood risk management plans – which must, of course, be carefully coordinated with the provisions of the Water Framework Directive and the river basin management plans. The plans must be based on an integration of the relevant sector policies and strategies.

Assessment of the EU's water scarcity and drought policy

ACTeon reviewed the situation of the EU's water scarcity and drought policy by combining the LISFLOOD and the WaterGAP *(Water – Global Assessment and Prognosis)* models, as commissioned by the European Commission (ACTEON, 2012). According to the results and findings of the model analyses water scarcity (water stress) is affecting some 10%, and 23%, of the total area of Europe during the whole of the year, and in the summer months, respectively. According to ACTeon's results the Danube River Basin and the area of Hungary are not affected by water scarcity. In 2030, some 30 %, and 45%, of the area of Europe will be facing water shortages during the whole of the year, and in the summer months, respectively. According to the report, in the Danube River Basin it is only in Bulgaria and in Romania that water scarcity will have to be expected.

According to the analyses the number of river basins exposed to water stress throughout the year will increase from 26 to 47 by 2030 (the size of the water-stressed areas will increase from 460,000 km^2 to 1,290,000 km^2). As for seasonal water scarcity, the number of water-stressed river basins will grow from 43 to 63 (doubling the 990,000 km^2 area that is affected at present). *A number of countries in Northern Europe are already facing water scarcity and the trends in those countries are also unfavourable.* Accordingly, more than one countries in Northern Europe have to take preventive and/or adaptive actions to make sure that water scarcity and the resulting deterioration of water security do not cause disproportionately heavy damage.

The European Drought Centre *(EDC),* a virtual centre of organizations engaged in drought research and operational drought management, facilitates the joint utilization of the knowledge accumulated by European countries in terms of good practices in drought management. The long term goal of the centre is to promote European cooperation towards reducing droughts' impacts and effects on society, economy and the environment, and preventing the decline of water security caused by droughts (Lavaysse, 2015).

Water security in the Danube River Basin

Cross-border river basins are posing unprecedented challenges to integrated water management. Cross-border collaboration has been practised for centuries in the Danube River Basin (DRB) and the Danube River is frequently referred to as the "world's most international river basin" (ICPDR, 2016). The area is shared by as many as 19 countries and is home to more than 81 million people. It is about 20% of the EU's inland area (approx. 800,000 km^2), characterized by a wide variety of different landscapes, and massive social and economic differences among the countries concerned.

The Danube River Protection Convention

It was back in 1992 that the United Nations Economic Commission for Europe (UNECE) Convention on the protection and use of transboundary watercourses and international lakes (Helsinki Convention) was signed. In 1994 the convention served as a model for the drafting of the Convention on Co-operation for the Protection and Sustainable Use of the River Danube and it provided a legal framework for cooperation in water management. The adoption of an integrated approach to water management posed a major challenge in the preparation and implementation of the Danube River Protection Convention (DRPC), which took the participation of countries of different histories, languages, cultures and economic situations, as well as different needs in regard to water management (Ijjas, 2004a; 2004b).

A significant proportion of the water resources in the Danube River Basin has been damaged or is being threatened, and are, accordingly, in need of protection. Work in improving the quality of water is crucial if sustainable development is to be ensured. Each "Danube country" of the territory of which more than 2000 km^2 is located in the area of the Danube River Basin, participates in the Danube River Protection Convention. The EU itself also qualifies as a party to the Convention. *The International Commission for the Protection of the Danube River (ICPDR) is currently the largest international organization of experts on river basin management in Europe,* whose mission is to support and coordinate sustainable water management in the Danube River Basin.

Back in 1994 when the Danube River Protection Convention was signed, Germany was the only EU member state among the parties. By 1998, when the activities of the ICPDR were launched, Austria had also joined the EU. Today 9 of the 14 countries in the Danube Region are members of the Union. In 2000 every party to the convention agreed to coordinate the implementation of the WFD across the area of the Danube River Basin. The agreement was supplemented in 2007 by integrating flood risk management.

Cross-border river basin management and water security in the Danube river basin

The Danube River Protection Convention – which plays a major role in enhancing water security as well in the river basin and which profoundly affects Hungary's water security – is often referred to as an example of good practices in integrated international water manage-

ment (ICPDR, 2014b). The ICPDR is extremely effective in coordinating the implementation of the Convention. The first cross-border river basin management plan was prepared for the Danube River Basin in 2009. The plan was duly introduced and its revision, the second river basin management plan, has been completed recently (ICPDR, 2015a; 2015b). One of the most important achievements is that the world's first cross-border climate change adaptation strategy has been adopted in regard to the Danube River Basin (ICPDR, 2013b). As a member of the international network of river basins engaged in efforts towards climate change adaptation they share their experience accumulated in the Danube River Basin with others. The ICPDR is regarded as a pioneer in the coordination of water management with other sectors, particularly in view of the guides prepared with the involvement of various stakeholder groups for sustainable waterway planning and for the planning of sustainable utilization of hydropower (ICPDR, 2010; 2012; 2013a; IJJAS, 2014a; 2014c). It is highly rewarding that the methods outlined in the guides have also been recommended to other European countries, while the use of the manual on the planning of sustainable waterways has been recommended at a global level for the development of inland navigation. The development of methods for hierarchic river basin management planning and coordination in large river basin areas is an important achievement of the countries sharing the Danube River Basin (IJJAS, 2004a; 2004b). Three main levels of planning and coordination have been identified:

- the level of the Danube River Basin (issues affecting the entire Danube River Basin),
- bilateral or multilateral level (problems with bilateral or multilateral cross-border impacts),
- national level (all problems and issues relating to river basin management, other than the above two).

The Joint Danube Survey *(JDS)* is a good example for the methods of collaboration in large international river basin areas. The survey has been carried out once in every 6 years since 2001. It is the report on the third survey, conducted in 2013, that contains the largest amount of information ever to have been gathered in the Danube River Basin in a single document, concerning the status of the Danube River. It took 6 weeks for an international group of 20 scientists to collect information from measurements carried out and samples taken at 68 places along the river. The data were assessed from three interrelated perspectives (biological, chemical and hydromorphological status) to see whether the status of the water has improved or deteriorated. The most important result of the third survey was the finding of the fact that the chemical status of the Danube River had improved considerably but its ecological and hydromorphological status had not improved as much as expected.

The following five Danube countries are not members of the EU: Bosnia-Herzegovina, Moldova, Montenegro, Serbia and Ukraine. These countries are under no obligation to implement the Water Framework Directive (WFD) or any of the associated EU legislation. Nonetheless, *every one of the countries sharing the Danube River Basin have undertaken to adopt and introduce the provisions laid down in the WFD.*

A total of four major cross-border issues were identified in the Danube River Basin management plan. Each of the issues is to be managed at a river basin level, and each affects both the Danube River and the Black Sea:

- nutrient load, leading to eutrophication and the development of eutrophic circumstances,
- organic substance load, causing low dissolved oxygen levels,
- dangerous substances, leading to toxic circumstances from an environmental aspect,
- hydromorphological changes, leading to the loss of wetland habitats and negative impacts on natural flow conditions, creating obstacles to migrating fish.

More than 80% of the entire length of the Danube River has been regulated for flood protection. The hydromorphological and ecological status of the water bodies have been changed by hydropower plants in 30% of the length of the river. About half of the Danube tributaries are used for hydropower generation. The total output of the power plants operating in the river basin is some 30,000 MW, which is an important factor of the implementation of the renewable energy policy. A total of 1018 dams have been constructed on the watercourses of the Danube River Basin whose own specific river basins are larger than 4000 km2. 598 of them are barrages, 296 sills or spillovers, and the remaining 124 are other facilities blocking passability. A total of 47% of the blockages cause less than 5 metres of difference between the surface levels on the upstream and the downstream sides in normal circumstances. 21% cause differences between 5 and 15 metres and 6% of the dams produce water level differences exceeding 15 metres. Up to 2015 a total of 335 of the blockages had to be supplemented with fish stairs according to the plans (no information is available as yet on how many have actually been constructed), while the remaining 628 will continue to block fish migration in the rivers. These must also be rendered passable for fish if ecosystem security is to be achieved. According to UN-Water's definition of the concept (UN-Water, 2013) the security of aquatic ecosystems is a key element of water security. Accordingly, securing passability is a basic prerequisite for achieving an acceptable level of security in aquatic ecosystems.

The EU's Danube Region Strategy

In 2009 the EU worked out a "macro regional" economic strategy for the Baltic Sea Region, followed, in 2011, by the development of a similar strategy for the Danube Region (EC, 2010). In 2014 the European Council asked the European Commission to work out a strategy for the Adriatic Region and the Ionian Region as well. Macro regional strategies are aimed at working out new projects and initiatives to promote joint implementation of development projects in the interest of the region concerned, thereby improving the utilization of the EU funds allocated to such projects. The Union's Danube Region Strategy lays emphasis on the WFD and flood risk management (FRM), and it applies a much wider interpretation of the concept of integrated water management than does the WFD (Ijjas, 2013).

The strategy identifies a total of 11 priority areas. The activities carried out in regard to each priority area are jointly coordinated by two participating countries. Hungary participates in the coordination of both water management related priority areas. The fourth priority area (water quality) is coordinated by Hungary and Slovakia, while the fifth one (environmental risks) is coordinated by Hungary and Romania. *The actions in both priority areas contribute to the accomplishment of water security of an acceptable level.*

Importance at the level of the river basin as a whole is the key criterion for the selection of projects and activities. This involves questions and issues necessitating joint actions planned and coordinated by countries sharing the river basin's area at the level of the river basin as a whole, along with the application of cooperation mechanisms between ministries and/or sectors, together with the integration of different sector policies. The Danube Strategy supports projects promoting sustainable development, whose implementation is in the interest of multiple regions and/or countries of the Danube River Basin. *The actions and projects of the strategy improve the statuses of waters and mitigate environmental risks (risks of floods, inland excess water, water scarcity and droughts), thereby playing an important role in accomplishing water security in the Danube River Basin.*

Water security in Hungary

Water security has so far been generally interpreted in Hungary as drinking water security in its strict sense. At the same time, we have carried out, and are performing at present, a variety of activities that are aimed, at accomplishing water security according to the general interpretation applied by UN-Water (2013), but we do not emphasize the roles played by such activities in enhancing water security. We are facing a wide variety of water management related problems that necessitate enhancement of water security in the general sense of the term (Somlyódy, 2011; OVF, 2015a; 2015b). For this reason, it is crucially important that we join international water security enhancement programmes and realize the vision of a "water-secure Hungary." We are working on a significant proportion of the tasks aimed at increasing water security in the sense defined by UN-Water (2013) together with EU member states, or the countries sharing the area of the Danube River Basin, based on shared principles, methods and work programme(s), as noted in previous chapters. At this point we are only discussing domestic specifics of water security.

Drinking water security in Hungary

Hungary had made significant efforts towards drinking water security even before global and EU-wide security programmes were launched: for instance by introducing an obligation for the development and adoption of water resource protection plans [Government Decree 123/1997. (VII. 18.) on the protection of water resources, prospective water resources and water facilities for drinking water supply]. Back in the 1980s Hungary was the second country in Europe to introduce fines in a system introduced with the aim of protecting water quality, a proof of the expertise and foresight of Hungarian professionals even in spite the difficulties of application in practice and certain flaws of the scheme. It is beyond doubt, however, that EU directives and actions pertaining to drinking water security were highly effective in promoting the enhancement of drinking water security (EU CIS, 2007).

Terrorist acts, as well as certain disasters caused by human activity or natural factors, played a very important role across the globe in triggering programmes towards strengthening drinking water security and water security. A variety of acts and other pieces of legislation were adopted in response to such acts and disasters with the aim of affording

protection to vital water management system elements and water facilities, in the context of the protection of critical infrastructure (Homeland Security – Environmental Protection Agency, 2007; EC, 2012d; Berek–Rácz, 2013; Bocsok–Borbély, 2012; Bognár, 2012; OKI, 2009a; 2009b).

The most important pieces of legislation in place for enhancing drinking water security and for protecting critical water infrastructure:

- Directive 2000/60/EC establishing a framework for Community action in the field of water policy (commonly known as: the Water Framework Directive)
- Government Decree 201/2001. (X. 25.) on quality requirements for drinking water and the regime of controlling
- 2008/114/EC of 8. December, 2008 on the identification and designation of European critical infrastructures and the assessment of the need to improve their protection, 23.12.2008 Official Journal of the European Union L 345/75
- Government Resolution 2080/2008. (VI. 30.) on the national programme for the protection of critical infrastructure
- Act CLXVI of 2012 on the identification, designation and protection of critical systems
- Government Decree 541/2013. (XII. 30.) on the identification, designation and protection of critical water management system elements and water facilities

Further progress was enabled in enhancing drinking water security by Government Decree 201/2001. (X. 25.) which defined the concept of drinking water security as follows: "Drinking water security is a quality and operational characteristic relating to drinking water consumption and use, that than be achieved in the system in place for the extraction of drinking water, for the treatment and for the supply of water, in the household drinking water network and at places where water can be drawn, entailing the lowest possible risk to human health." This definition reduces the general concept of water security, worked out by UN-Water (2013), to drinking water security, and it means the application and enforcement of the relevant strict regulations.

Protective zones of drinking water abstraction sites

Protection of water resources from which drinking water is abstracted is one of the most critical elements of achieving drinking water security. The environmental action plan adopted by Government Resolution 3058/3581/1991. (XII. 9.), which prescribed the development of an action programme for the protection of drinking water resources, played a key role in this aspect. The rules on the protection of water resources were laid down in Government Decree 123/1997. (VII. 18.). A targeted development programme was launched in 1995 with the aim of determining and designating the protective areas and protective zones specified in the Government Decree, performing status assessment activities and developing a monitoring network. Although much of the tasks prescribed at that time were carried out, the second river basin management plan still contains references to quite a number of actions that need to be executed.

The above regulation of the protection of water resources is in line with the provisions of the Water Framework Directive calling for protection of the environment of water abstraction sites on which drinking water supply relies. In Hungary this means the protection of a total of 1933 public operating, reserve and prospective groundwater resources and 19 surface water abstractions.

Drinking water security planning in Hungary and in EU member states

Government Decree 201/2001. (X. 25.) prescribed the preparation of drinking water security plans. The term "drinking water security plan" is defined in the Government Decree as follows: "A drinking water security plan is the water security governance regime of a drinking water supply system providing consumers with water exceeding 10 m^3/day on an annual average, or a drinking water supply system providing more than 50 permanent residents with water. A drinking water security plan may be approved if its operation ensures the supply of the population with healthy drinking water."

It was from the end of 2003 that the European Commission was calling on member states to apply the WHO's "water security planning" initiative in order to ensure the quality of water for human consumption. Therefore the EC DG Environment worked out the following recommendations:

(1) The member states should provide the continuous operation of a risk assessment and management system for their water supply systems
(2) A drinking water risk management system should comprise at least the following elements:
   (a) description of the water supply system,
   (b) hazard analysis and risk assessment,
   (c) measurements and their evaluation, to control risks,
   (d) installation of a monitoring system for controlling,
   (e) assessment of the drinking water risk management system,
   (f) continuous revision of elements (a)–(d).
(3) Operational documentation must be prepared of the elements listed in paragraph (2).
(4) The member states should ensure that all competent authorities and stakeholders can participate in the development of the drinking water risk management system and in the process of risk assessment.

The drinking water security plans prepared pursuant to the relevant Hungarian statutory regulations are in line with the above recommendations.

The Országos Közegészségügyi Intézet (National Public Health Institute, Hungarian acronym OKI) – in agreement with the relevant institutes of the WHO – considered the preparation and execution of drinking water security plan systems based on hazard analysis and risk assessment *(Water Safety Plans)* to be the most effective method for maintaining the security of drinking water supply (OKI, 2009a; 2009b). For this reason, the National Public Health and Medical Officer Service (Hungarian acronym: ÁNTSZ) – using manuals and aids worked out by the WHO, IWA and the Water Safety Working Group Hungarian

Water Utility Association – prepared a guide for the development and operation of drinking water security plan systems (or *Water Safety Plans*).

Assessment of the drinking water security situation

Hungary has practically fully comprehensive piped water supply coverage. Some 95% of all households – that is, 4.1 million households – are provided with piped water supply. Any demand can be met by the supply systems, in terms of quantity. The quality of water from certain drinking water resources, however, do not meet the requirements in regard to certain parameters. The situation is being improved by the ongoing drinking water resource protection and drinking water quality improvement programme (GWP Magyarország, 2016). *The current situation and the outlooks of drinking water security are regarded to be favourable in the light of the above and good status can be maintained in the long term.*

The role played by the provisions of the Water Framework Directive concerning protected areas in the accomplishment of water security

The main purpose of the WFD is *to accomplish and preserve the at least good status of all surface waters and groundwaters.* At the same time, the Directive also lays particular emphasis on the different types of protected areas. All areas and underground spaces designated as such quality as protected areas for the purposes of the WFD. These include the protected areas and protective zones of drinking water abstraction sites, nutrient and nitrate sensitive areas, natural bathing places, areas protected for their natural values and surface waters designated as habitat for fish. The second river basin management plan contains an assessment of the statuses of such protected areas and specifies actions and measures required for ensuring and/or preserving their good status. Some of the actions and measures ensuring good status of such areas are related to drinking water security, the rest of them are related to water security as the term is construed generally (UN-Water, 2013).

Flood security in Hungary

A total of nine record high floods passed down Hungary's large rivers during the 18 years since 1998, after only two such floods recorded in the preceding fifty years. Negative records were broken in 2015 by the rivers Rába, Hernád, Sajó, Szamos, Tisza and Sebes-Körös – where the all-time low or even lower water levels were reached; while the levels of water in other six of our rivers (including the Danube in some segments) came within 20 cm of the respective all-time low levels.

In response to floods in a number of its member states in the early 2000s the EU adopted legislation prescribing the preparation of flood risk management plans and thereby the improvement of flood security in the member states with significant flood risks. From its central funds the EU provides funding support to the implementation of the planned flood risk management actions. Accordingly, the EU's flood policy and regulations play an

important role in achieving flood security in Hungary. Floods occurring in Hungary are heavily influenced by human activities carried out in the Danube River Basin in countries upstream (and, to some extent, downstream) from Hungary, together with the hydrological and hydromorphological conditions in the river basin upstream from Hungary. In the first step the Danube countries prepared flood protection action plans for the entire river basin and for specific parts of the same, and then they worked out flood protection action plans in accordance with the EU's flood directive. These plans are of relevance to the flood security of the river basin as a whole, because they ensure collaboration among the countries sharing the river basin, as required for effective flood risk management.

In Hungary it was the further development of the Vásárhelyi Plan (that is, the development of the flood protection system of the Hungarian segment of the Tisza River) marked the launching of the most important flood risk management programme. Hungary's flood risk management programme is noted – besides the Dutch *Room for the Rivers* and the British *Making space for water* programmes – as one of Europe's largest integrated flood protection programme meeting the criteria of sustainability (Defra, 2005; OECD, 2014; SPKD, 2006a; 2006b). For the Vásárhelyi Plan extension programme to be an increase flood risk management programme of a scale, importance and standard the like of the *Room for the Rivers* and *Space for the Waters* programmes it should have designed (in addition to the construction of reservoirs to attenuate flood peaks), all actions to enable floods of the design levels to pass downriver, at lower water levels without raising the levels of, or strengthening the flood protection embankments. It may also be safe to say that at present the whole of Europe – but this may equally apply on a global scale – is busy seeking for the good practices that will be sufficient for tackling the challenges to be brought on by the 21st century, together with the expected climate change effects, as well as for regulation ensuring the application of such practices.

Extraordinary flood phenomena may occur increasingly frequently as a consequence of the ongoing climate change, therefore maintaining an acceptable level of flood security will continue to be one of the most important tasks of water management in the coming decades. The same applies to inland excess water security in the achievement and maintenance of which the retaining of water where it is produced (by rainfall or snowmelt) will play a particularly important role. In the case of watercourses of smaller river basins it is the increasingly frequent occurrence of extremely violent flash floods, affecting relatively small areas (e.g. the deluge in Northern Hungary in 2010 and in Budapest in 2015), calls for the development of infrastructure and actions for dealing with flash floods. Safe rainwater drainage and management in municipalities – already an important challenge facing water management in Hungary – will grow in importance.

Drought and water scarcity security in Hungary

In view of the amount of water flowing through the territory of Hungary, together with the amount of precipitation and the likely increase in the demand for water, no critical water scarcity or water stress needs to be expected to come about in this country. At the same time, severe droughts and local water scarcities require major actions to be taken to ensure the security of water supply in the broader sense of the term. Despite the fact that no critical

levels of water stress need to be expected at a national level, owing to the uneven distribution of Hungary's water resources in time and space *a growing number and variety of signs are pointing to an increasing need for regional water distribution to supply areas of water scarcity* (e.g. by channelling water from the Tisza River to the Körös Valley, operation of the Tisza Lake with the aim of keeping up the Tisza River as a natural live river and of supplying the town of Szolnok with water, replenishing Lake Velence from the reservoirs above it and replenishing the Szigetköz region).

Efforts made towards flood risk management have, during the past decades, been sidelined to some extent besides the river basin management planning activities as prescribed in the WFD and the focus on flood risk management planning. The so-called Kvassay Jenő Plan (OVF, 2015b) marks a turning point in this regard because it also deals with the future of drought management, particularly in view of the ongoing climate change. At present the main emphasis is laid on early drought forecasting, but sufficient actions will hopefully be taken towards the prevention of drought damage as well, during the coming 5-10 years. This is made all the more likely by the fact that the Rural Development Programme comprises a variety of funding sources for use in implementing drought risk management actions (e.g. irrigation development, reservoir construction).

The quantity statuses of Hungary's surface and groundwaters, falling short of "good" as prescribed in the Water Framework Directive necessitate additional actions for improvement, which will be made even more urgent by the threats of climate change. To achieve water security in agricultural production – primarily in areas where irrigation infrastructure was already put in place earlier – *there is a need for major irrigation development projects* for which funding is available in the context of the Rural Development Programme. Strict requirements and criteria are in place however, to ensure that irrigation infrastructure can only be installed in places where it does not jeopardize the water security of ecosystems.

Sanitation security in Hungary

Large-scale development projects implemented in recent years ensure that all municipalities of over 2000 population equivalent are adequately supplied with wastewater collection and treatment services. The most recent survey – of 2012 – shows that the proportion of untreated wastewater discharged into water bodies has been reduced to 0.8%, while the proportion of waste water undergoing only mechanical treatment before discharge into receiving water bodies is only 1.8%. The development projects increased the annual waste water treatment capacity by 300 million cubic metres between 2000 and 2013. Some 17% of the total Hungarian population live in municipalities of less than 2000 population equivalent, without wastewater treatment facilities. About 425,000 people living in 845 small municipalities are not provided with wastewater treatment services today (GWP Magyarország, 2016). Work is in progress towards resolving this issue.

Cross-border water security in Hungary

Some 95% of Hungary's water resources come from abroad, therefore the quantitative and qualitative statuses of our waters, that is, the degree of water security in Hungary, depend to a large extent, on the hydrological conditions and the activities carried out in countries upstream from us. *Improving what is called "cross-border water security" is a major challenge for Hungary.* Boundary water agreements have been in place for quite some time between Hungary and the seven neighbouring countries, in the context of which a wide variety of joint efforts have taken place. Work has got under way, during the past decade, on extending these agreements and collaborations from the water bodies constituting state borders to the entire areas of the shared river basins. International treaties and, particularly, the Water Framework Directive, may play an important role in cooperation. Despite the positive results so far (including, for instance, the shared river basin management plan covering the Danube River Basin, together with its renewal, the Danube River Basin's flood risk management plan etc.) *a lot has still to be done towards the application and enforcement of the provisions of the agreements and the enhancement of cross-border water security.*

The role of integrated water management in creating water security

Recent decades have seen the adoption of a number of water policy documents concluding that *integrated water management and integrated water management planning are important instruments to be applied in creating water security* (EC, 2012c; 2015a; EEA, 2012b; 2015; 2016a; OECD, 2013a; UN, 2012; GWP, 2015; Sadoff, 2015; Shah, 2016). Integrated water management plans (IWMP) and river basin management plans (RBMP) had been prepared in the United States and in European countries (including Hungary) for decades even before the UN and the GWP launched a global programme to spread and improve the practice of integrated water management planning. Meanwhile Europe *saw the adoption of the Water Framework Directive in the way of a global innovation, introducing a mandatory obligation in the whole of the European Union for authorities to work out river basin management plans (RBMP).* The river basin management plans prepared pursuant to the WFD integrated a variety of factors from a variety of aspects, but only to promote the aquatic environmental objectives laid down in the WFD. No measures or actions required for achieving economic or social goals however, therefore they cannot be regarded as fully integrated water management plans (GWP, 2015; Ijjas, 2014b).

A unique feature of water management in Europe is that EU member states prepare river basin management plans for their respective territories on the basis of a set of standardized principles. The plans so prepared lay down actions and measures whereby they can improve the statuses of all of their surface and groundwaters to reach the level categorized as "good" and/or keep up such good statuses, by 2015 at the latest (or, where justified, by 2021 or 2017). It is Europe's great achievement that the first river basin management plans had been worked out by the end of 2009 for nearly the whole of the territory of the Union and that the implementation of the first ones of them had been revised by end-2015, on the basis of whose results the member states worked out the revised second versions of their river basin management plans. The results are overshadowed by the fact that many of the

targets set to be reached by end-2015 could not be accomplished by the member states and that some of the provisions of the Water Framework Directive were not implemented by nearly any of the member states (GWP, 2015), such as the environmental assessment of the feasibility of the new investment projects on the basis of the WFD 4.7 test.

Achieving good status and protection of waters is a crucial task for human health and environmental security; however, Europe has in recent decades failed to lay adequate emphasis on satisfying the society's and the economy's demand for water, including the management of the risks of floods and droughts as well (GWP, 2015; Ijjas, 2014b). Owing to the criticality of the integrated water management process, analyses were worked out at global level, as encouraged by the UN and the GWP (UN, 2012), and at the level of different regions of the world, of the status of the application of integrated water management, its good practices, development possibilities and instruments. The report on the Central and East European region (CEE) refers to the special nature of the situation in Europe, even in its sub-heading: *Integrated Water Management vs. Water Framework Directive* (GWP, 2015). Its key authors (Janusz Kindler, István Ijjas and Danka Thalmeneirova) describe in the report the importance of river basin management as prescribed in the Water Framework Directive together with what other tasks need to be carried out in addition to those prescribed by the WFD and other related pieces of legislation to make sure that water management fulfils the functions expected of it by society and achieves water security in line with the definition of the term as developed by UN-Water (UN-Water, 2013).

The concept and importance of integrated water management

The past quarter of a century has seen profound changes in water management both globally and in Hungary. Concerted efforts were made at a global scale with the aim of tackling challenges in water management. The coordinated activities of countries all over the world affected water management in Hungary as well. Major changes in water management in Hungary were induced primarily by the efforts made towards adaptation to the European Union's water management policy and action programmes. This had a lot of positive effects but they were undoubtedly accompanied by some adverse consequences as well, when proven, up-to-date, effective methods well-adapted to the domestic environment were replaced by procedures of more general applicability, adopted by the member states of the European Union. On the whole however, the positive impacts of European collaboration far outweighed their negative consequences.

Integrated water management was to be based on an integrated water management strategy and planning. Global achievements and recommendations and those of the European Union have to be utilized in water management in Hungary, however, we must also rely on our own existing rich body of experience in integrated water management. The concept of integrated water management is interpreted by most countries and at most forums across the globe in accordance with the definition worked out by the GEP (GWP–TAC, 2000: 22.):

"Integrated water management is a process which promotes the coordinated development and management of water, land and related resources in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems."

The importance of and need for integrated water management is also reflected by changes in the EU water policy. The European Union has responded to existing and expected future challenges of water management by adapting its water policy. The essence of the changes is set forth in the *Water Blueprint* (EC, 2012c). To bolster water management the EU has developed a new strategy aimed at *ensuring good quality water in sufficient quantities* for all legitimate uses. According to the *Water Blueprint* (EC, 2012c) at present the general objective of the EU's water policy is to provide access for all Europeans to good quality water of sufficient quantity and to achieve and preserve good status of all waters in the whole of Europe. In fact, these efforts are aimed at achieving what is referred to as water security in UN-Water's interpretation (UN-Water, 2013).

Integrated water management planning in the European Union

The purpose of the river basin management plans prepared in accordance with the WFD is to prescribe action programmes for achieving and preserving good status of waters. For "fully integrated" river basin management such plans need to be supplemented and coordinated with protection against damage by waters and with action programmes aimed at attaining economic and social goals relating to water use. Water management needs to be integrated with plans, programmes and policies of various economic sectors also in the river basin management plans prepared on the basis of the WFD and with plans ensuring the achievement of economic and social objectives (GWP, 2015; Ijjas, 2014b; EC, 2016).

Integrating water management into the plans of an economic sector means the planning of action programmes ensuring the satisfaction of the need of the economy and reducing or eliminating economic damage, while having only such negative impact on the statuses of waters that still qualify as "acceptable" from the aspect of the WFD. The key is to produce plans satisfying the sectors' water management related needs that are at the same time in line with the WDF.

Relationships and interactions between water policy and water management planning, along with other policies and planning processes, need to be taken into account if integration is to be successful:

- water policy is closely linked to natural boundaries (river basins), while other policies are linked more to administrative and/or political borders;
- the effectiveness of the policy is influenced by a host of processes taking place by chance;
- the application or assertion of water policy is particularly complicated in large river basins such as that of the Danube, Tisza or Dráva rivers, where countries sharing the river basins need to coordinate their activities for many of the water management objectives to be accomplished.

The right choice of the level of integration is key:

- in some cases integration is required at the level of the river basin concerned (e.g. in water quality regulation, in coordinating nature conservation with flood protection);

- in other cases integration is required at a national level, in accordance with state boundaries (e.g. coordinating water resource management and environmental regulations);
- while in some cases integration is required at the level of the European Union (e.g. in coordinating the WFD, the Common Agricultural Policy and the Structural Funds).

Waters accumulating in a river basin bring together the effects of human activities affecting the status of waters all over the whole of the area. Such activities influence the quantity and quality of the water accumulating in the river basin, together with the status of the water dependent flora and fauna. Accumulating water carries sediment and pollutants. Most pollutants are bound to sediment particles while being carried by water. Part of the pollutants decompose while being carried by water, depending on run-off conditions, including travelling time, or they accumulate in plants and animals, or just settle with the sediment. The contaminated sediment deposited in river beds may, through a series of transformations, turn into "time bombs." For this reason, the actions required for satisfying water-related needs and for achieving the prescribed good status of waters may, if they involve activities having negative impacts on larger segments of the basin, only be worked out through integrated water management planning covering the whole of the river basin concerned.

Water management planning must be aimed at working out actions whereby good status of water resources can be achieved and maintained and whereby it is possible to satisfy water-related needs that are in line with the relevant economic and social objectives without unacceptable impairment of the statuses of waters. Actions may be "structural" (like the construction of hydraulic engineering structures) or "non-structural" (like the introduction of legal or economic regulations, the improvement of people's water and environmental awareness).

Planning within the meaning of the WFD integrates a host of perspectives, but for the most part only with the aim of achieving good status of waters. This cannot be regarded as a deficiency, since the WFD is aimed at achieving and preserving the good status of waters, which is, at the same time, a fundamental prerequisite for sustainable development. According to the basic documents governing its operation (primarily owing to the principle of subsidiarity) the EU cannot make it a mandatory obligation for its member states to apply the planning requirements pertaining to integrated water management. The WFD requires the preparation of river basin management plans to protect the aquatic environment and it sets out the contents and methods of such plans. The content and methods of the other component of planning may be determined by the member states themselves. The EU-level policies and strategies jointly adopted by the member states must be taken into account in this second part of water management planning, however, these do not entail such strong and legally binding obligations as do the provisions laid down in the WFD. It is by way of its aid policy that the EU encourages member states to apply and comply with strategies and sector policies formulated at the level of the Union.

The experts who drafted the Water Framework Directive narrowed the concept of river basin management to actions aimed at achieving and preserving the good status of waters. Wider interpretations of the concept of river basin management are used outside Europe, where the term is used for water management practices specifying and implementing actions

required for satisfying environmental, economic and social needs as well. EU membership entails an obligation for Hungary to prepare river basin management plans in line with the Framework Directive; on the other hand, we must work out our own integrated water management planning system, one that will provide for the planning of actions taking care of the water management tasks that are required reaching economic and social objectives as well.

Water and the future – a world of water security

World Water Forum for a water-secure world

The way people think of and about water has been changing for the better in the last decades. A significant proportion of the population, together with politicians, have been gradually and increasingly realising how water security and economic growth are interrelated and are now seeking for mitigating risks caused by social and economic processes as well as extreme weather phenomena.

A World Water Forum has been held once every three years since 1997, where experts, together with prominent leaders of the participating states, discuss how water management challenges can be tackled. The seventh Forum took place in 2015. The growing importance of water is indicated by the fact that this was the largest ever organized event focusing on water management, with 46,000 participants and 106 high ranking state leaders of 168 countries discussed, in as many as 400 different sections, what role water will be playing in the future (with *Water for Our Future* being the key topic of the forum) and how the world can get prepared for it.

The seventh world forum proposed four action programmes for responding to challenges of water management. The first of the action programmes is entitled *Water security for all.* A total of four sub-themes were designated within this topic for the work programme: 1. Enough safer water for all; 2. Integrated sanitation for all; 3. Adapting to Change: Managing Risk and Uncertainty for Resilience and Disaster Preparedness; 4. Infrastructure for Sustainable Water Resource Management and Services (WWC, 2015a; 2015b; 2015c).

World Economic Forum (WEF) for a water-secure world

The *Global Risks Report* (World Economic Forum, 2016) discussed at the 2016 World Economic Forum on global economic challenges and risks ranked water-related problems among the most sever risk factors to be faced during the next 10-year period. It warned decision makers that without good policy decisions climate change would make the situation even worse than it currently was. The report pointed out that water is a critical problem for mankind, one of the central issues of both sustainable development and climate change. The most conspicuous effects of climate change as regards water management are longer periods of droughts, coupled with more and more devastating floods. Climate change challenges cannot be managed without dealing with water problems (World Economic Forum, 2016).

According to the *Global Risks Report* at present the five most profound risks include the risks of adaptation to the effects of climate change, weapons of mass destruction, the water

crisis, mass migration and energy price changes. The report points out that the potential climate change may have a fundamental impact on water crisis which, in turn, may lead to conflicts and increasingly intensive migration. This necessitates improvements in water administration, to enable better adaptation to the effects of climate change, population growth and economic development, together with the management of risks entailed by the global refugee crisis and the fourth industrial revolution. In addition to risks stemming from the close nexus between water security and climate change the WEF report regards the mutually related risks of food security and climate change to represent the highest priority threats.

Water and food security in 2050

The High Level Panel for Water and Food Security organized by FAO and WWC worked out a paper in preparation for the World Water Forum of 2015, on the expected situation in terms of water and food security in 2050 (FAO–WWC, 2015). The paper drew attention to the following, among other things:

- Some 9-10 billion people will be living on Earth in 2050; feeding them will take major actions in both the public and the private sectors. *At a global scale there might be enough water for producing the required amount of food but the uneven distribution of water resources in space and time will be causing severe water scarcities in many more places than are faced today.* The situation will be aggravated by the expected unfavourable effects of climate change.
- The population of cities primarily in developing countries will be growing substantially up to 2050, leading to growing urban demand for water and food. Agriculture will still be the biggest global user of water in 2050.
- At present some 20% of the world's farmlands are irrigated, accounting for 40% of the total global produce. These ratios will increase substantially up to 2050, despite efforts aimed at improving the efficiency of water use.

The price of a water-secure world

Achieving water security is one of the key prerequisites for sustainable growth. This requires the management of a variety of risks, including water scarcity (too little water), floods (too much water), inadequate water supply and sanitation, poor water quality and degradation of aquatic ecosystems. *Full water security can never be achieved*, and the level to be targeted depends on the levels to which the above risks need to be mitigated for society to find them acceptable and affordable. The construction of the infrastructure required for achieving water security is a costly process. It was in awareness of this that the high level panel of the World Water Council and the OECD prepared a report on the expected costs of the infrastructure required for the realization of the vision of a water-secure world, and the possibilities of financing it (WWC–OECD, 2015).

A review of the scenarios of expected future needs for water shows that the available water resources will, in many regions of the world, not be sufficient for satisfying the demand. According to scenarios examined by the OECD the total global demand for water

will grow by 55% up to 2050. Growth will be most dramatic in the BRICS countries (Brazil, Russia, India, China and South-Africa). On the other hand, demand for water in the OECD countries will decrease somewhat.

A wide variety of estimates of different results have been worked out concerning the costs of the infrastructure required for accomplishing a water-secure world, due to the multitude of different factors taken into account (for example, the use of a narrower interpretation of the concept of water security, meaning only the security of drinking water supplies and sanitation, or a broader interpretation). The minimum and maximum amounts of the global annual cost of the infrastructure concerned are, according to the above estimates:

- providing for water supply and sanitation corresponding to the millennium development goals: USD 27–205 billion;
- adapting water infrastructure to climate change in developing countries: USD 75–100 billion;
- global wastewater treatment: USD 123–135 billion;
- all infrastructure elements increasing water security at a global level: USD 500–1037 billion;

The above annual costs – with the exception of the last item – reflect only the investment costs, which may be increased substantially by the costs of operation and maintenance. Accordingly, the total cost of the water infrastructure is estimated to be about USD 11,700 billion between 2013 and 2030. This amount is similar to the cost of the infrastructure required for the production of the necessary energy (USD 12,200 billion), somewhat smaller than the cost of road construction (USD 16,600 billion) and larger than the cost of the telecommunication infrastructure (USD 9,500 billion). Despite the uncertainties lying in the above estimates it may be concluded from the results of the WWC and OECD panel that the realization of the vision of a water-secure world will require massive amounts of funds during the coming decades, more even than the amounts being spent on the same today. The fact that various global and international forums are busy working on finding possible ways to cut these costs, may give rise to some measure of optimism.

Science for water security

Research activities on the more distant future of water management have been growing increasingly intensive in recent years. For example, the International Institute for Applied Systems Analysis (IIASA) scrutinized – with the help of global water management scenario models – the interactions between water, food, energy, climate and environment, to establish future hotspots of water insecurity along with possible effects on food and energy security. Difficulties relating to projections on the future of water resources are reflected by the wide range of the IIASA estimates of the amount of water that will be required in 2050: industry's demand for water is expected to increase from 750–900 km^3/year today to 1200–2000 km^3/year, while household water consumption will – factoring in the estimated population growth as well – is expected to grow from today's 400–450 km^3/year to 700–1500 km^3/year (IIASA, 2016).

One of the most important research programmes currently under way towards achieving a water-secure world is called *Sustainable Water Future Programme*, which is based on the recommendations set forth in the *Bonn declaration on global water security* of 2013. The programme is part of the global programme called *Future Earth*, aimed at facilitating adaptation to the global climate change. The active involvement, and the recognition of the achievements, of Hungarian scientists in tackling global water management challenges is reflected by the fact that three of the members of the Planning Committee working out the foundations for the programme come or originate from Hungary: András Szöllősi-Nagy, János Bogárdi and Charles Vörösmarty. The programme played a leading role in the preparation of the scientific programme of the 2016 Budapest Water Summit (Sustainable Water Future Programme, 2015).

Research efforts seeking for new ways to solving water problems are of outstanding importance. For example, an increasing number of experts are now convinced that rather than water scarcity, the main risks for the world include weaknesses in the systems of state administration in charge of water management, calling for improvements in the institutional framework of water management. We are not managing water resources frugally enough and do not afford adequate protection for the available resources. It is also said the vast quantities of food (and so water) wasted would be enough for feeding 2 billion people. Water consumption could also be reduced by changing the menu, replacing food produced with a high water input with products of smaller water footprints. A sustainable global virtual water market could be put in place, whereby the world's renewable water resources could be utilized more efficiently, producing foodstuffs of higher water requirement in regions where there is enough water for doing so.

Hungary for a water-secure world – Budapest Water Summit 2016

At the end of 2016 Hungary – together with the World Water Council – organized a global water summit in Budapest. The patron of the event was János Áder, President of the Republic of Hungary. The aim of the conference was to turn water from a source of conflicts and risks in the 21st century into a source of cooperation, peace and development, for all countries striving for sustainable development. The organization of the Budapest Water Summit 2016 and the participation of the representatives of science in Hungary in the preparation of the scientific forum of the summit shows how Hungary wishes to make its contribution to resolving global water problems and realising the vision of a water-secure world. It is hoped that this strong intent and political commitment will also result in resolving Hungary's own water problems, and in efforts aimed at creating general domestic water security that is acceptable to society, in the entire field of water management, that is, a "water-secure Hungary."

Conclusions and proposals

Our paper discusses certain high priority issues relating to water security, without intending to provide a comprehensive, all-encompassing overview of the different challenges. Our

analysis may, however, form the basis of such a comprehensive study. Our most important conclusions and proposals concerning water security are as follows:

- In view of the available literature the global water situation is more than disconcerting and the prevailing trends are unfavourable. This conclusion is even more apt in view of regional variability and its indicators. Therefore *there is a case for performing a comprehensive analysis of water security, and for involving it in decision making at different levels.* This will make it possible to take into consideration a range of complex and new impacts and effects.
- Hungary made considerable efforts and achieved a lot of progress towards water security in earlier years too but even more has been achieved in this field since the system change (the 1990s and, in particular, since Hungary's EU candidacy and membership).
- *One of the most important factors in enhancing water security was the introduction of the EU Water Framework Directive,* and other related legislation, together with the preparation and revision of river basin management plans. The actions laid down in the river basin management plans ensure protection of human life and health, along with the statuses of waters and aquatic ecosystems in each EU member state on the basis of harmonized, mandatory regulations, with shared objectives that are to be achieved by joint efforts.
- The EU Directives have created the regulatory framework for the achievement of drinking water and outdoor bathing water security and of ecosystem security of a level that is acceptable for the society. *Adequate sanitation* plays an important role in achieving and preserving the good status of waters, *the ensuring of which is prescribed by the Water Framework Directive.* Major developments have been made in this field during the past decade.
- The strict and standardized regulations on drinking water and outdoor bathing water as well as ecosystem security are regarded as outstanding European achievements. Compliance with the rules is, however, challenged by the fact that the system of the prescribed environmental assessments is too complex, difficult to overview and carry out, and that it is extremely resource-intensive.
- *Flood risk management plans and the riverbed management plans for high waters supplementing the flood risk management plans, have been worked out for the whole of the European Union, the Danube River Basin and Hungary* based on the EU flood risk management directive, in accordance with the river basin management plans. The implementation of the planned actions will ensure that flood security is raised to a reasonable level.
- *Activities aimed at strengthening inland excess water security* are as a specific Hungarian solution, are under way in parallel with the efforts made in the way of flood risk management, but the expected results have not, for the time being, been clarified.
- Preparations for solutions to problems in *municipal rainwater management* are also in progress. Solutions enabling the enhancement of water security to an acceptable level in these fields will hopefully be found for preventing and eliminating damage caused by floods, inland excess water and excess municipal rainwater.

- Having joined the EU's drought management actions Hungary is laying increased emphasis on the *management of the risks of droughts*. It seems at present that similarly to EU-level actions emphasis will be laid on the early forecasting of drought phenomena. Experience shows that actions preventing damage by drought may be even more important than early forecasting in dealing with drought damage.
- The provisions laid down in the Water Framework Directive ensure protection of the qualitative and quantitative status of surface and underground waters, including the water resources available for use. However, the WFD does not (and is not meant to) regulate how the security of water services can be ensured for the users. This will have to be provided for in separate *water resource management plans* integrated with the river basin management plans prepared in accordance with the provisions of the WFD.
- According to the definition adopted by UN-Water *the concept of water security includes the security of the satisfaction of welfare related requirements and those relating to spending spare time on coasts and beaches as well* (in addition to outdoor bathing water security). These are not covered by current water security programmes. The satisfaction of such requirements must also be put on the agenda.
- It is crucial for all aspects of water security that the effects of climate change be taken into account and that "climate resilient" methods of adaptation are sought for and applied. Emphasis must be laid on such tasks in the research and development programmes and climate adaptation plans of the coming decade.
- There are critical environmental aspects to flood and inland excess water risk management, municipal rainwater management, drought management and climate adaptation, but in essence these are not *activities for environmental but economic and social purposes*, which may also only be based on sound foundations by integrated river basin planning.
- It should be noted that before the entry into force of the WFD a number of EU member states – including Hungary – had well-established integrated water management planning systems, but *no integrated water management planning system adapted to the WFD has been put in place as yet*. Effective integrated water management is an important prerequisite for water security as well. There are two ways for going about it:
  - The Water Framework Directive should be transformed and turned into a general EU-level water management framework directive comprising provisions ensuring the attainment of social and economic goals as well. This solution is unlikely to be adopted in the next decade.
  - A water management system integrated with the WFD should be worked out, one that deals with water management issues that are important for society but the WFD does not envisage actions for resolving them.

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Food Safety

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Abstract

The provision of mankind with adequate quality and quantity of food has always been one of the most crucial issues in human history. The protection of food and potable water sources, the survival of not only individual human beings but also of mankind depends on the availability of food and potable water. Knowledge about food poisoning had been obtained empirically for a long time, which was then passed on through generations.

As a result of the social, economic and environmental changes over the past century, which often grew global, the importance of food safety has increased considerably with the rise of consumer awareness. At the same time, recent scientific advances have allowed us to learn more about the hazards that characterize food safety. The problems that arise have to be dealt with more extensely, from the field to the table of the consumer.

In addition to giving an introduction to the effects of factors influencing food safety on both the local and global levels, the present chapter also presents facts about food safety. Policy principles and debated issues concerning food safety are discussed along with the ways how food safety is achieved, including decision-making based on risk analysis.

The chapter also explains the roles of the authorities in maintaining food-chain safety and highlights the risks and dangers related to the adulteration of food as well as the deliberate contamination of food (food terrorism).

Keywords: food chain, risk, strategy, food defence, food safety, food security

Introduction

Providing people with food in adequate quantities has, throughout the history of mankind, been a vital requirement in both peacetime and war. Securing food and feed supplies has been of outstanding importance, together with the protection of potable water resources, as the survival of both the individual and, in a broader sense, humankind, has always depended on the availability of food and drinking water. Any other need may only be taken care of when these have been made available (Maslow, 1954).

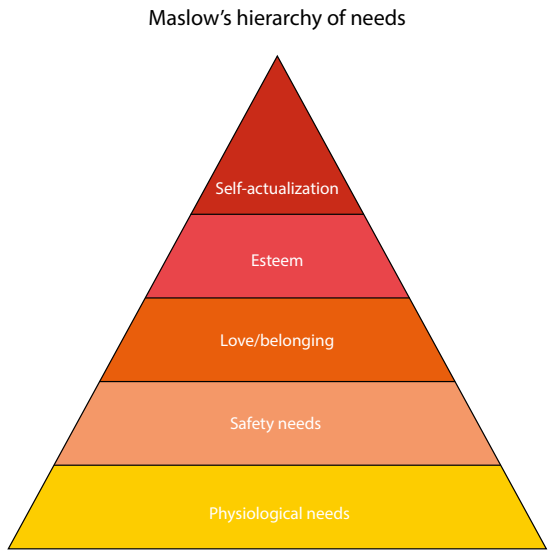

Figure 1
Maslow's pyramid

Source: Maslow, 1954

Knowledge about diseases that came to be associated with food consumption, and the phenomenon of foodstuffs deteriorating to a degree where their instincts forbade eating them, accumulated though experience, in the course of sourcing, storing and consuming food. In the case of sickness immediately or shortly after eating was easily associated with the symptoms as the factor that triggered or intermediated them, although in relation to economic and political conflicts food-borne sickness or even death was often mistaken for deliberate poisoning. In the case of conditions that were slow to develop over a long period of time, it took quite a while before the causal relationship underlying unpleasant experiences were realized.

In the absence of adequate scientific knowledge sometimes it took hundreds of years before the actual cause of a particular disease that came and went like an epidemic was discovered and the necessary actions could be taken. This was the case with deficiency diseases such as scurvy and beriberi, but also in the case of chronic led poisoning, a condition which allegedly contributed to the downfall of the Roman Empire as well, or epidemics, caused by mycotoxins produced by various microfungi, developing slowly but then affecting entire provinces and generations from time to time in history. Other examples include "Saint

Anthony's fire" or ergotism, or the so-called alimentary toxic aleukia, which brought down large numbers of people for example in the territory of the Soviet Union, primarily in the Caspian region, and caused the death of more than 100,000 people, according to estimates (Szeitzné Szabó, 2016).

Changes in social and economic conditions have always raised issues relating to the security of food supplies, highlighting, at the same time, the importance of food safety as well. In addition to adequate quantity, the quality of food was paramount (they should not be spoiled, disgusting or adulterated), and that it should be safe to consume (it should cause no sickness or death). Our predecessors accomplished incredible deeds – even by the standards of our current knowledge – when, without any knowledge about microbiology, based solely on experience and observations, they managed to take enough food for journeys of exploration taking months to complete, military campaigns to conquer distant lands, or long sea journeys. Knowledge was passed down through generations and often ended up enshrined in religious instructions or acts of law of the day. The hygiene of food production and storage has always been taken seriously and those breaking the rules were in for some tough punishment.

Food products have never been as safe as they are today in developed countries, including Hungary; however, the extent of potential risks, and the population's dependence on food supplies, has never been as great as today, as a consequence of world trade, globalization, urbanization and the food chain's energy dependence.

Concepts relating to food-related safety and security issues

Issues of safety and security regarding the food supplies of humankind, or the population in a narrower sense, are closely related to the following concepts:

- *Food security:* the continuous availability and accessibility of safe and nutritious food supplies of sufficient quantity.
- *Food safety:* assurance that food will not cause harm to the consumer when it is prepared and/or eaten according to its intended use.
- *Food chain safety:* ensuring that the food chain does not entail unacceptable health or economic risks for the individual or society.
- *Food defence:* protection of food supplies from intentionally caused damage.
- *Food terrorism:* intentional contamination or poisoning of food supplies for ideological or political purposes.
- *Food fraud:* illegal altering the composition and/or marking of food products for the purpose of economic or financial gains.

It should be pointed out that in practice there are no clear distinctions between these concepts; they are interrelated and often overlap each other. In a narrow sense of the term, the definition of food safety applies only to the health effects of food products ready for consumption, however, in a broader sense, as in everyday use, it extends to food chain safety, it is mutually interdependent with food security and it covers all activities and effects relating to the production and consumption of foodstuffs. Definitions applying to deliberate illegal manipulation of food products may also apply to mutually interrelated activities,

be discussed in more detail below. Important concepts relating to foodstuffs such as food quality, ethical food production or fair trade will only be mentioned as and when they have to do with safety.

International and domestic situation

Humankind's food production and consumption habits have changed more during the past 50–100 years than during thousands of years before. Supply of food to the population which is constantly growing – and is increasingly exacting – involves mass production of the foodstuffs and their input materials. It does not take long for these products, together with pathogens and toxic substances, to reach virtually any part of the world through the free movement of goods, advanced transports and world trade. *Threats relating to food consumption have reached a new dimension, risks have taken on a global scale.*

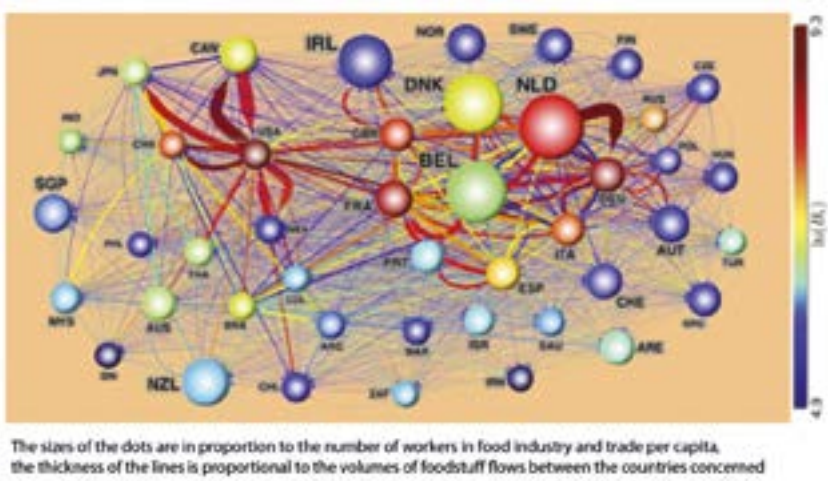

Figure 2

The most important food flows among countries as points connected in a network (USD)

Source: Ercsey–Ravasz et al., 2012

The food chain (or more precisely: the food net or food mesh) is growing increasingly complicated nowadays (Figure 2), with products becoming increasingly more difficult to keep tracks of. Food marketing and distribution is motivated by increasingly wide and complex networks of commercial and economic interests. Production is becoming increasingly concentrated and it takes less and less time for products to reach consumers all over the world. Consequently, the number of people exposed to the treats of deliberate contamination or accidental defects is constantly increasing.

Science has developed new live organisms that previously never existed in nature, and it has produced new types of food and new technologies (e.g. genetic modification, nanotechnology), whose safety is not yet corroborated by experience built up over long

periods of time. Growing environmental contamination appears in our food. On the other hand, we also contaminate our environment by food production and transport. Besides their indubitable benefits, scientific, technological and social progress may even entail new types of threats of global dimensions to our health and the safety and security of food production. New trends also include a growing consumer awareness and increasingly effective activities on the part of consumer interest groups, affecting the food chain and the related actions and developments. Quite often, however, consumers' risk perceptions are not based on scientific facts and groundless concerns can even lead – with the help of the media and the internet – to panic and boycotts of certain types of food or products, or business undertakings.

The increasing prices of growing food and feed production, the increasing food, feed and energy prices, as well as the increasing costs of food safety actions are posing a major challenge. Situations may arise in which the scarcity of food resources or considerations of maintaining food security necessitates a revision of the need for strict food safety actions, particularly decisions concerning destruction from the aspect of the frugal management of food resources.

Factors affecting the situation of food safety

Food safety is affected by a variety of factors, many of which interact with each other. Some of the most important reasons for today's situation give rise to concerns even on a global scale:

1. The pollution of the environment

Human activity today is responsible for gradualy polluting the natural environment. Pollutants may end up in our food and so affect human health. At the same time, the mass production of foodstuffs itself – cropping, livestock production, food processing, trade and the spreading of disposable packaging materials – also contributes to environmental pollution. The contamination of meat products and guar gum with dioxin and the mercury and arsenic contamination of sea fish were alarming examples of environmental/industrial pollutants finding their way into the food chain. Toxins, viruses and bacteria are incorporated in seafood as a consequence of the contamination of seawater, causing epidemics. The pollution of surface waters affects the purity of waters used for irrigation and, consequently the safety of vegetables and fruits.

2. Global environmental and climate changes

Agriculture is profoundly affected by the current global environment and climate change processes. Changes in the global climate may trigger the appearance and drive the spreading of new pests, weeds and mycotoxin-producing microfungi (the amount of mycotoxins produced by mould fungi increases in response to environmental stress and in dry conditions). Floods and droughts reduce crop yields and lower their quality, if not entirely destroying them, potentially causing food scarcity. Due to their genetic variability and short reproductive cycles, pathogens are quick to respond to environmental stress – they adapt to changed circumstances through the evolution of resilient, stress tolerant strains and variants, or ones with changed virulence, or even altogether new forms may appear (Farkas et al., 2013).

Infectious diseases carried by vectors appear to be spreading to new areas (such as the spreading in Europe of the viruses causing the blue tongue disease or the West Nile fever).

Weather extremes have been growing in frequency in many places all over the world as a result of changes in environmental impacts, and this may enhance the loss of soil fertility (erosion). Moreover, improper land use practices trigger soil degradation processes in many places, undermining the security of food supplies, together with food safety itself. Rising atmospheric CO_2 levels on the other hand are causing difficulties in the uptake of certain nutrient elements in various crop categories (papilionaceous plants, cereals) which may lead to symptoms of under-nourishment in billions of people (Myers et al., 2014).

3. Changes in agricultural and food industry technologies

Feeding the growing population with its demand for more and better food is no longer feasible by conventional agricultural production. Rising living standards in developing countries are accompanied by growing demand for foodstuffs of animal origin. Both livestock and crop production have adopted techniques of mass production in the course of which the use of agricultural chemicals, yield enhancers and veterinary medicines entails risks of contamination of both the environment and raw materials of food products and of the consumption of chemical residues together with food. To satisfy changed consumer demand and as automatically entailed by technical development, processes applied by the food industry are changing continuously, new techniques or ones not widely applied hitherto, are being introduced. Technological changes may have sometimes unpredictable consequences as regards food safety. The complexity of the situation is indicated by the fact that changes may appear in the following areas (Győri, 2012):

- increase in average yields in field crop production and horticulture (fertilizers, plant protection products, new varieties, machines, expertise)
- production rate increases in livestock production (feed mixes, new breeds, fisheries)
- concentration of production,
- concentration of processing,
- concentration of the product distribution,
- accelerating urbanization, creation of megacities,
- growing rule of public catering,
- growing importance of logistics.

4. Effects of world trade, free trade and globalization

The food chain is growing increasingly complicated, products are becoming ever more difficult to keep tracks of. Food marketing and distribution is motivated by increasingly wide and complex networks of commercial and economic interests. Production is becoming increasingly concentrated and it takes less and less time for products to reach consumers all over the world. It has been found in numerous cases that the authorities' investigations following the detection of a contamination reveal that the goods had been reloaded, distributed, carried here and there from country to country, repackaged, mixed into other products, processed etc. In this way, clarifying where the goods concerned started out and where they ended up may take so long that in the end it is no longer possible to take timely action (withdrawal, destruction). This is why there is a growing demand for transparency and traceability (Figure 3) in the food chain.

Figure 3
Linkages in the food chain

Source: Raspor, 2008

5. Evolution of gigantic cities, supply centres, commercial hubs and food concerns
Populations worldwide have been growing increasingly reliant on larger and larger factories and food industry enterprises for food supplies, while catering is being provided for by industrial-sized food factories producing an ever increasing numbers of portions. So a contaminated product may bring down large numbers of consumers at the same time. Junctions and hubs, ports, distribution and warehousing centres of immense proportions have come about in the network of international trade and if any of them is terminated or disabled by a targeted attack or a disaster the whole network and supply chain may be incapacitated or collapse.

Supplying gigantic metropolises of tens of millions of inhabitants with food and pure drinking water is becoming increasingly difficult. Mention must also be made of the disposal of waste and wastewater produced in such gigantic cities, along with the threat of epidemics and the extensive distribution – even in other countries' markets – of contaminated produce grown around cities, often irrigated with wastewater. These processes have also been playing a role in the development of the so-called *"urban agriculture*" involving primarily the production of horticultural products as well as the keeping of certain animals (like fish, bees etc.).

6. The food chain's energy dependence
There is now practically no process in the food chain that does not depend on energy supply, that can do without energy. Cropping and livestock production have both become dependent on energy supply. This applies even to reproduction, as artificial insemination and the incubation of eggs also require energy. The transport of raw materials and food products

requires fuel, food production and storage requires electricity. Even retail units cannot continue operating during a power outage. We cannot even imagine our world without refrigerators. Computers, other IT devices, programs, telecommunication networks as well as the world wide net; they all require energy for functioning. Energy supply is, by all means, critical infrastructure; when it is cut, in war, by an act of terrorism or natural disaster, the result is disruption of the food supply and other vital consequences.

7. Changing ways of life

In the wake of efforts made to avoid contaminated food products and endeavours towards healthy nutrition, demand is on the increase among the population for fresh and less processed food products. In some cases this demand leads to a conflict between nutritional advantages and food safety risks. The growing consumption of raw plant parts (seeds, germinated seeds, leaves) creates a new medium for the spreading of infectious microbes. Ecological farming may entail a growth of mycotoxin contamination and the bypassing of food preserving technologies leads to increased microbial exposure. Growth in tourism entails an increase in imported infections. Less and less food is prepared and consumed by people at home, while more and more people eat ready meals and other convenience products supplied by the food industry, eat out or order food deliveries, whereby they are growing increasingly exposed. Exposure is also increased by the fact that less and less food is produced by people for themselves. Household gardens and farmyards are no longer cultivated, pigsties and poultry pens are empty now – even people in villages go to the store for their daily food requirements. Practically nobody is keeping food reserves at home – in towns and in rural areas alike – which would make it possible for families to survive longer periods of time. This is why the protection of infrastructure required for stockpiling food raw materials and food products is a strategic issue.

8. Weakening immune condition

Improvements in living conditions have been accompanied by an increase in the number of people with altered immune conditions, whose resistance to infections has decreased wither because of their age, condition (children, elderly people, pregnant women) or being on medication. The population's resilience is also being eroded by chemicals, alien to the human body, that are present in very small amounts in the environment. The negative impacts of mycotoxins, dioxins and certain plant protection products, are all too well known. By contrast, the immune system may respond to growing exposure to alien substances by excessive activity, allergy and inflammation.

9. Growth in faking and fraud, threat of terrorism

These types of criminal activities have increased in scale, they have taken on international dimensions, causing serious threats. Faking, fraud and intentional food contamination have become a major health hazard that conventional national food control systems find more and more difficult to counter. Chinese import feed and food products adulterated with melanin, have caused the deaths of thousands of livestock and made hundreds of thousands of children sick, as such feeds and food products were exported all over the world. There is a realistic threat of terrorist groups poisoning or infesting feed or food products, to draw attention to their causes or in retaliation.

Food safety facts

It was in 2015 that the *World Health Organization, (WHO)* updated its factual information concerning the situation regarding food safety (WHO, 2015), highlighting the following:

- Access to sufficient quantities of safe and nourishing food is key to life and good health.
- Unsafe foodstuffs containing harmful bacteria, viruses, parasites or chemicals may cause more than 200 different diseases, ranging from diarrhoea to tumours.
- About 600 million people, that is, about a tenth of the total human population get sick each year and about 420,000 people die as a consequence of consuming contaminated food. This means 33 million healthy life-years lost (Sassy, 2006; Phillips–Thompson, 2009) to societies.
- Some 40% of food-borne diseases affect children below 5 years of age, taking the lives of 125,000 each year.
- Diarrhoea is the most frequent symptom of illnesses relating to food consumption, affecting 550,000-1,000,000 people a year, causing the deaths of 230,000.
- Food safety and the safety of nutrition and food supply are inseparably interrelated with each other. Through the interaction between disease and under-nourishment unsafe food threatens the lives primarily of children, the ailing and the elderly (Angulo et al., 1998).
- Food-borne diseases impede society's social-economic development by overstretching the health care system, reducing economic performance and jeopardising tourism and trade.
- The food supply chain has come to be extended over and across national borders many times over. Only close cooperation involving governments, producers and consumers may facilitate a positive shift in the food safety situation.

Strategic considerations

Food safety involves the widest possible range of scientific fields, social groups and societal aspects. A wide range of environmental and agricultural sciences, plant and animal health, veterinary research are related directly to agricultural production, food science and food technology, consumer perception are related to food supply and distribution, along with – in interaction with each of these – chemistry, analytical sciences, microbiology and human health. Also related are nearly all facets of state administration and government, economics, financial policy, social policy, education, industry, as well as governmental and non-governmental organizations protecting consumers' health and interests. *There is practically no scientific discipline or field that would not be directly or indirectly involved in or related to food safety (4. figure).*

Food safety must be examined in a complex way, in its environment, social, economic and nutrition-related contexts. Efficient, coordinated and effective activities and improvements in food safety require a food safety policy backed by the government's commitment and support, and the development and implementation of a single, harmonized national food safety programme based on established, clearly expressed national goals and priori-

ties, taking into account the entire process of foodstuff production, the whole of the food chain, from farm to fork.

Figure 4

Linkages between elements and factors of food safety

Source: Szeitzné Szabó, 2011

International background

Both the World Health Organization and the European Union are strongly urging and promoting the development of national food safety programmes. Consumers are also placing a growing pressure on the governments of their countries for effective actions to ensure food safety.

It was with a view to high level protection of consumers' health, as the primary goal, that the European Union released in January 2000 the document entitled *White Paper on Food Safety*, laying down the basic principles of the Union's food safety and nutrition policy, together with a detailed action plan, broken down into milestones. Its most important content elements – including the basic principles, the establishment of the European Food Safety Authority, the tasks relating quick response to threats and the related communications and actions – were also integrated in Regulation (EC) No 178/2002 laying down the general principles and requirements of food law (that is, the Union's food law), in the form of mandatory requirements. It was in 2002 that the European Union established the *European Food Safety Authority (EFSA),* primarily for working out estimates of health risks relating to the consumption of foodstuffs. The European Union's research projects under framework programmes also lay particular emphasis on food safety.

The new national food safety programme of the USA was launched in 1997 under the title of *(Food Safety from Farm to Table: a New Strategy for the 21st Century).* With the growing threat of terrorist acts, based on the framework constituted by the *Food Terrorism Act*, a variety of major, strict regulations were introduced concerning the controls over imported and domestic products (2007), while year 2008 saw the release of the *Food Protection Plan,* which contains additional strategic elements (US–FDA, 2008).

Of the relevant international organizations both WHO and FAO keeps issuing warnings on a regular basis concerning the importance of food safety. In 1983 the FAO–WHO *Expert Committee on Food Safety* came to the conclusion that the consumption of contaminated food leads to most sickness and diseases all over the world, and that this is the primary factor hindering the economic performance of nations. In year 2000, the WHO *Executive Board* announced, at its 105th meeting, the strengthening and extension of its food safety programme, under the title of *New Food Safety Programme.* The programme urges countries to view food safety as the most essential public health function and allocate the necessary funds to national food safety programmes. It also calls on countries to work out their single, harmonized monitoring and surveillance systems and that they should carry out risk analyses as a basis for their actions, integrate food safety in their ongoing education and nutrition-health programmes and make sure to develop coordinated cooperation with the involvement of different participants of food safety. It was on the basis of the above programme that the WHO worked out and released its food safety strategy in 2002 *(WHO Global Strategy for Food Safety: Safer Food for Better Health).* For the implementation of the food and nutrition policy to be applied across the European Union the WHO worked out a new action plan (WHO, 2008).

Amidst global threats, there was an increasingly urgent demand for an immediate and extensive alarm mechanism and information exchange in relation to threats as they occur. By transforming its earlier systems the European Union put in place its *Rapid Alert System for Food and Feed (RASFF),* with a contact point in every single member state. The WHO also created its global food safety information and alarm system, called *INFOSAN Emergency*, which has been growing more and more intensively over time.

New mandatory *International Health Regulation* has been adopted, covering food safety as well. International strategic activities were also launched to make it possible to produce projections of climate change effects and to enable preparations (with the involvement of FAO, WHO and EFSA) (FAO, 2008). Based on the above international proposals and experience work has been started in a number of countries on developing and implementing national food safety programmes, in some cases in combination with nutrition-related programmes.

Strategic preparations in Hungary

The Working Committee on Nutrition Science of the Complex Committee for Food Science Hungarian Academy of Sciences started working, as early as in 1993, on a study entitled *Recommendations for developing a domestic food and nutrition policy*, which was submitted in 1999 to the Prime Minister's Office and to the ministers involved directly or indirectly in matters of food and nutrition.

Having recognized the importance of food safety, based on similar international a new organization called Food Safety Consulting Body was set up examples in the autumn of 1997 based on a joint initiative of the Ministry of Public Welfare and the Ministry of Agriculture. The members of the body included representatives of the ministries dealing with matters relating to food safety, authorities involved in food controlling activities, bodies of nationwide competencies, scientific institutes, associations, interest organizations and consumers.

Contributing to the elaboration of the national food safety programme was considered to be the new body's first and most important task. To this end, it carried out an assessment of the domestic food safety situation with the involvement of a variety of experts. The assessment under the title of Magyarország élelmiszer-biztonsági helyzete az ezredfordulón (Hungary's food safety situation at the turn of the millennium) was published in 2000 (Szeitzné Szabó, 2000). It was submitted to the Prime Minister's Office and the ministries concerned, in order to enable the development and implementation – based on the assessment – of a *National Food Safety Programme (NFSP)* (Szeitzné Szabó, 2004)

The NFSP was completed – with the active participation of the Food Safety Consulting Body and renowned Hungarian experts – in early 2004, before Hungary's accession to the European Union, and it prescribed the following:

- the basic principles of the national food safety policy,
- the main goals and national priorities.

Sub-programmes were worked out for the various priorities, discussing the domestic and international situation regarding the subjects concerned, together with the relevant issues and tasks, in more detail. The programme was closely coordinated with the objectives specified by UN's world organizations dealing with matters of food safety (FAO, WHO, OIE) and the EU's food safety policy. It conveyed a single, harmonized attitude relating to food safety and it provided an overview, laid down fundamental perspectives, directions and objectives, on the basis of which every governmental and non-governmental participant having to do with food safety could work out its own action plan for its own specific technical/professional area. The programme found its way to the World Health Organization and the European Union, and came to be quoted more than once in strategic documents concerning Hungary. However, it never got to be submitted to Parliament, it received no political support. In this sense it never became official, it was never provided with financial support and did not have to be implemented on a mandatory basis. It fulfilled its mission however, in the sense that it was taken into account by decision makers and other experts in their work and could make good use of its content.

Food safety has undergone changes since the issuance of the NFSP. Hungary joined the EU in 2004, which entailed profound changes in its legal regulation, institution system and the requirements that must be met by businesses. The freedom of movement of goods meant that the earlier system of official authorization (permission) of products had to be dumped. National regulations were replaced by EU rules.

The Hungarian Food Safety Office (HFSO) was launched as the domestic partner organization of the European Food Safety Authority. Primary responsibility was assigned to businesses – they must operate internal food safety systems, however, they are not fully up to such a responsibility yet. The roles of media and communication have grown stronger and more important than ever before and they have assumed an opinion leader function. An

increasing number of food safety incidents made front page news, spreading uncertainty among consumers. The majority of the cases concerned involved deliberate fraud or reckless "money-saving" efforts.

Strategic goals and priorities changed in the new situation. All of these changes necessitated a revision, review and updating of the National Food Safety Programme. This task was undertaken by the Subcommittee on Food Safety of the President's Committee on Environmental Sciences, a committee set up on the basis of a decision taken by the President of the Hungarian Academy of Sciences, in cooperation with the Hungarian Food Safety Office (HFSO). The draft was prepared by staff members and the scientific committees of the Hungarian Food Safety Office as well as representatives of the specific field concerned. It was then discussed by the Subcommittee on Subcommittee on Food Safety of the President's Committee in several rounds. Finally, the draft, supplemented and modified in accordance with the subcommittee's proposals and opinion, got to be accepted. Thereafter the Scientific Advisory Board of the HFSO – its members including representatives of the ministries, authorities and institutions concerned, sciences, interest organizations, civil society organizations and consumers – evaluated and made comments on the draft. In this way, it was based on broad agreement and consensus.

The revised new food safety programme came out with the title *Élelmiszer-biztonság: tények, tendenciák, teendők* (Food safety: facts, trends, tasks to do) (Szeitzné Szabó, 2011), and it comprised the basic principles the food safety policy, the main strategic goals, priorities and the subprogrammes for their implementation. (Table 1).

Table 1

Elements of the food safety programme

The basic principles underlying the food safety policy
1. Comprehensive approach, from farm to fork
2. Consumer orientation
3. Transparency
4. Underlying scientific fundamentals
5. Integrated approach
6. Everybody has a role
Key strategic goals
1. Alleviated negative impact from the environment
2. Reduced contamination resulting from the food chain
3. Transparent and simpler food chain
4. Responsible, well-prepared and fair businesses
5. Effective and efficient, unified, quickly responding officialfood control
6. Coordinated fight against fraud and counterfeiting
7. Wide-spread knowledge about food safety adoption and requirement of high standards
8. Support for scientific research and application of its results and achievements

Subprogrammes towards achieving strategic goals

1. Taking into account all of the complex relationships and mechanisms of food safety
2. *Enhancing and improving microbiological food safety*
3. Enhancing and improving chemical food safety
4. Assumption of responsibility, and review of tasks, of the government and its authorities
5. Enforcement of food industry businesses to live up to their responsibilities
6. Protection of the food chain
7. Affording special protection to vulnerable consumer groups
8. Facilitating the safety of unconventional foodstuffs
9. Improvement of training, education and communication
10. Promotion of research and development in relation to food safety

Source: Szeitzné Szabó, 2011

Each subprogrammes discusses the situation of the given priority theme, together with changes that have occurred since the preparation of the previous food safety programme (2004), the main problems/issues and the proposed tasks, highlighting the ones that need to be implemented with the highest urgency.

In the framework of its strategic programmes launched in its capacity as a public body the Hungarian Academy of Sciences identified the establishment and creation of the domestic conditions and requisites of achieving food security and food safety in Hungary as being one of the dominant issues determining Hungary's future. It was to this end that it decided on the publication of the paper entitled *Élelmezésbiztonság* (Food Security) (Csáki, 2010), discussing its subject based on strategic aspects of Hungary's food economy, rural development and food safety. The chapter on food safety relies primarily on the aforementioned new national food safety programme, in fact, practically citing it word by word.

These were the forward looking scientific papers that constituted the foundations for the governmental strategy which was released in 2013, under the title of *Élelmiszerlánc-biztonsági stratégia 2013–2022* (Food Chain Safety Strategy 2013–2011) (VM–NÉBIH, 2013), adopted by Government Resolution 1703/2013. (X. 8.). The strategy laid down the key objectives and tasks relating to food chain safety for a 10-year period, with guidance on how the objectives should be achieved.

Two key target areas are identified in the strategy. The first is food chain safety knowledge management, aiming at the creation and operation of a knowledge centre, the development of a knowledge network, as well as innovation. The second target area is that of food chain risk management, distinguishing between the surveillance of known risks and the management of unknown threats and risks of unacceptably high levels. In the latter field the strategy lays particular emphasis on the fight against infringements (specifically, against the black and grey economy) and the protection of critical infrastructure systems.

Relationship between food security and food safety

The 1996 FAO–WHO *World Food Summit* defined food security as follows: "all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (FAO, 1996).

Access in this case means, on the one hand, a physical access – the availability of adequate quantities of food – and, on the other hand, the financial safety that enables actual access to, and the purchase of, foodstuffs. According to the latest FAO report (FAO, 2015) there are still 795 million undernourished or starving people in the world.

Food security is based on three pillars:

- continuous availability of safe and nourishing food in adequate quantities;
- financial background, for accessing food products enabling adequate nutrition;
- availability of basic knowledge concerning proper nutrition, food storage and preparation, availability of hygienic conditions, including safe water supply.

Achieving and maintaining food security is such a complex task for society which is related to health, social security, order across society, under- and over-nourishment, sustainable production and adequate distribution of food and, as such, and in a broader sense, to all other areas discussed in the previous chapter.

Food security is closely and inseparably related to food safety, as is already indicated in its definition: an adequate supply of *safe* food is required. Otherwise an under-nourished body will suffer even more harm as a consequence of the consumption of contaminated food. This is said because in circumstances of food scarcity people will eat contaminated food, bread baked from mouldy grains and the meat of animals weakened by disease, as proven by countless sad examples in the history of epidemics. On the other hand, excessively strict food safety regulations may lead to the disposal and/or destruction of foodstuffs that are still suitable for human consumption. Exporting produce would be vital for developing countries but developed countries are sometimes unwilling to permit such products to enter their markets, with reference to their high standards of and strict regulations on hygiene.

In a broader sense the concepts of nutrition and food security may include food *aid* and food *wastage* indeed, more indirectly, the matter of a *fair trade* as well. Unfortunately, there still are situations, armed conflicts, natural disasters and political upheavals – indeed, the number of such incidents may even be on the increase – where survival can only be ensured by means of aids. The questions to be faced include how to deliver surpluses to those in need, what quality of/how safe food may be donated as aid, how can these be distributed/allocated, how to store such supplies and how can it be ensured that they actually reach those in need. Should they be delivered directly to the needy or to the governments of the recipient countries? Should help be provided in the form of donations or by assisting local farmers/purchasing their produce? And if their produce is purchased, does it qualify as exploitation or what is taking place in such cases qualifies as fair trade promoting sustainability? Another valid question from the aspect of the developed countries and the European Union is whether food prices would remain affordable without agricultural production being subsidize with huge amounts making up a considerable proportion of the entire annual budget.

Issues in dispute

On many issues, even the experts disagree. Opposite positions are held concerning – inter alia – the following:

- is there a real food shortage or there is a sufficient quantity of food but it is poorly distributed;
- can food production keep abreast with population growth in the future;
- is the current forms and level of food production sustainable and can its development be continued;
- should food security to be guaranteed at a national level or is it no longer necessary in the age of global trade;
- is globalization a source or solution of the problem for less affluent areas and underdeveloped economies.

The most heated debates and disputes have evolved perhaps in regard to genetic modification, affecting the security of food supplies, the sustainability of environmental diversity and food safety.

Genetically modified food

As regards genetic modification, particular attention must be paid to assessing the possible effects of genetically modified plants and animals, and the food produced from them, on food security and safety. This is a double-edged achievement of modern technology and whether the benefits or the risks are laid more of an emphasis on depends to a large extent on whether one sides with the arguments of those in favour or those against this technique. This is said because many of the modifications have been developed in pursuit of food safety and security objectives. The development of drought tolerant or pest resistant varieties may contribute to increasing yields and cutting losses. On the other hand, GM organisms may find their way into the environment, alter biodiversity and irrevocably contaminate hitherto GMO-free areas. By contrast, where genetic modification is used for developing produce with seeds that do not germinate complications of a different nature are bound to be faced, also affecting food supplies. This is because farmers cannot reserve seeds for sowing next year, instead, they have to purchase sowing seeds from the large GM concerns again and again, making them heavily dependent on the latter.

The area under GM crops is continuously increasing all over the world, primarily in the US, Argentina, Canada and China. The countries growing GM crops in Europe are said to include Bulgaria, Romania and Spain. The most important genetically modified plant species include soya, cotton, maize and sugar beet, along with, to a lesser extent, tomato and potato. Experimental breeding of genetically modified animals is in progress – the products may appear in practice within a few years' time. GM salmon will soon be on the tables of consumers in the US. Microorganisms with modified traits have long been used for the production of human and animal medicines and enzymes. The latter are widely used all over the world in the production of beverages and in breweries, in the baking industry and in detergents.

First generation GM plants have advantageous characteristics primarily from the aspect of crop production (insect resistance, chemical tolerance, drought tolerance etc.). Second generation GM food products are, on the other hand, created with the aim of satisfying consumers' needs (e.g. increasing vitamin content, removal of allergenic genes). Issues like genetically modified organisms, GMO sowing seeds, cereals and food products, are subject to heated debates across societies today. Environmental and consumer protection groups and organizations oppose the production, processing and integration in the food chain of genetically modified organisms, GMO plants and cereals, because we have no adequate knowledge yet of their impacts on the environment and human health.

Extensive public opinion surveys, carried out in numerous countries, have clearly established that most people are against, and unwilling to accept, GMO food. Those opposing the technology argue that GMOs may pollinate/fertilize related species and thus make organic farming impossible, carry risks of evolution of "super weeds' and jeopardize biodiversity. Research and studies into the impacts of GMO technologies on the ecosystem are being carried out. The agro-biotechnology business and multinational enterprises promote the technological and economic benefits and advantages offered by GMO cropping. Indeed, they even employ an economic pressure to have GMO production and marketing licensed as quickly as possible. Science is not yet in a position where it could take a clear stance concerning negative effects on human health or the environment that could be attributed to GMOs. Therefore – emphasising the so-called precautionary principle – the European Union applies a strict case-by-case licensing process in regard to such products.

It was relatively early, back in 1988, that Hungary adopted an act of law on activities involving genetic technologies and the adoption of the act was quickly followed by that of its implementing decree. The legislation was in line with the effective EU regulations and as a result of its amendments introduced in 2002 Hungary's accession to the European Union was a smooth process in regard to these regulations. The bone of contention today is whether a country has a right to prohibit the production of any GM crop or livestock. Since recombinant DNA technology itself only dates back to a few decades (and its products have not been present in the environment even that long), studies of its complex and extensive interactions have only just begun, and perhaps we cannot even see the whole extent of the area to be explored.

The consumption of genetically modified plants and food products made from them may, theoretically, have a variety of negative impacts on human health – similarly to plants not genetically modified, among which one also finds poisonous and allergenic ones. While however, it has taken centuries for mankind to choose those of the conventional plants that are safe to eat, we have precious little experience in relation to GMO crops. Theoretically, their consumption may, in the long run, be adverse to health: it may cause allergic responses, promote the propagation of bacteria that are resistant to antibiotics, or lead to other health impairment.

As regards the GM plants currently licensed to be produced and marketed in the European Union the institutions issuing the licences found that no such risks are to be faced in the case of the plants and product concerned and no health issues have been encountered in practice in association with the consumption of such licensed products. However, in the case of radical interventions such as changing the genome, consequences not expected even by scientists specialising in the given field may occur, or whose effects take a long time to

appear. Consequently, licences for GMOs must be renewed from time to time (once every ten years, under the current regulation).

It is not possible to make general statements concerning the safety of GM products; it varies from case to case, depending on the specific GM food product concerned. GM food products on the international markets have undergone risk assessment and been found to be unlikely to carry any risk to human health. Judgements of the safety of GM food products must be based on continuous risk assessments as in line with the principles laid down in the FAO–WHO *Codex Alimentarius* and be based on traceability, once on the market.

In addition to possible health effects a variety of *environmental concerns of economic importance* need to be discussed in relation to GMO-containing products. The key argument of countries calling for the banning of the production of genetically modified plants is that GM plants carry a major environmental risk to their natural values. Concerns that have been identified include, among other things, gene flow (escape), the transgene's potential integration in wild populations, the gene's retaining its activity after the GM plant's harvest, vulnerability of non-target organizations to the gene product (e.g. insects that are not categorized as pests), gene stability, the decrease of other plants' habitats, including loss of biodiversity and the increased use of chemicals in agriculture. GM plants' environmental safety considerations vary considerably depending on local conditions. Research projects currently in progress are aimed at possible negative effects on useful insects, on the accelerated evolution of resistant insects, the possible development of new phytopathogens, possible negative consequences affecting plant diversity and wildlife, or, in some cases the reduced frequency of the application of crop rotation and the transfer of genes carrying chemical resistance to other plants. Economic, social and legal aspects of GMO-related issues also need to be discussed.

With a view to the above concerns and uncertainties, in line with the precautionary principle, Article XX of Hungary's Fundamental Law provides as follows:

> *"(1) Everyone shall have the right to physical and mental health.*
>
> *(2) Hungary shall promote the effective application of the right referred to in Paragraph (1) **by an agriculture free of genetically modified organisms**, by ensuring access to healthy food and drinking water, by organising safety at work and healthcare provision, by supporting sports and regular physical exercise, as well as by ensuring the protection of the environment."*

Food-safety

In a narrow sense, food safety is the assurance that food will not cause harm to the consumer when it is prepared and/or eaten according to its intended use. (CAC, 1969). In a broader sense, the concept covers the entire process, from farm to fork, who's adequate and closely monitored operation results in safe products landing on the consumer's dinner table. Food safety is not merely a strategic issue affecting only our health; it also affects our economy, the marketability of our products, the international perception of our country, the welfare of all of us and the future of our children. The existing food safety situation may only be maintained and improved through extensive domestic and international cooperation, based on strategic principles and goals, with strong governmental commitment.

Food production and marketing are important economic activities, the primary aim of which is – besides profit making – to supply the population with sufficient quantities of safe food products of a quality accepted by consumers. Food consumption – taking meals – is an important part of the lives of both the individual and the society as a whole. Through the continuous supply of the necessary energy and the body's building blocks, basic nutrients, minerals and other essential components of foodstuffs are the source of a sustainable good physical condition and health. In addition to this, eating is one of the primary sources of joy, one of the pillars of family ties and social relations. For these to be true, there needs to be a supply of high quality, healthy and safe food of adequate quantity for both the individual and the society as a whole, together with social customs and traditions promoting the consumption of healthy food in adequate quantities and of suitable compositions, as required by the human body.

Foodstuffs, may, however, have negative impacts on the health of both individuals or entire populations. The following main types of adverse health effects may be distinguished:

- Problems developing in the short or long term as a consequence of the contamination of foodstuffs (infections, poisoning, late inflammatory diseases and tumours that can be traced back to food consumption).
- Ailments developing as a consequence of the body's individual responsiveness and/or health status (allergy, intolerance, chronic gastrointestinal diseases).
- Nutritional problems that can be traced back to the consumption of too little or too much of various food components or to the inadequacy of the quantity of the food-intake.

This is a complex issue: food security mutually interrelated with responses and lack of trust among people, which necessitates both national and international actions, together with raising awareness of the fact that the safety and the nutritional aspects of food consumption are often mutually, sometimes inseparably, linked to one another. Although health issues and chronic illnesses resulting from inadequate nutrition are likely to be placing a significantly heavier burden on the society as a whole in developed countries than diseases caused by inadequate food safety, the latter, however, may lead to acute, disastrous health situations and economic crises a lot more quickly, in some cases in just a matter of hours. However the European Union has, quite rightly, adopted regulations not only for the prevention of food induced epidemics, infections and poisoning but also the management issues such as the production of foodstuffs for people suffering from food allergies and people in need of special nutrition or diets, together even with other nutrition-related problems.

Food safety and its importance

The formally accepted definition of ***food safety*** as noted above may suggest that there is such a thing as completely *safe food.* Nonetheless, professionals and experts have always been aware of the fact that the safety of food may only be something relative. One of the most fundamental demands of consumers in all societies that the government should guarantee safe food supplies, however, food cannot be always safe for everybody – as has been proven by recently uncovered cases in which the given food product could not have been

prepared in any way safer than it actually was, at the given level of knowledge and technical development. Two basic categories of food-borne hazards are distinguished: the ones we know something about, and the ones that are hitherto unknown. At the time of consumption before 1996 nobody knew anything about the potential dangers of disease caused in the human body by eating beef infected with BSE, or about the human health effects of dioxin mixed in to chicken feed. Therefore, if we want to be honest and wish to achieve the highest possible target, we must say that *we want to produce as safe food product as can be possibly produced in the given circumstances, taking into account the society's resources as well.*

Unsafe food

In the process whereby the European Union adopted a new food law and released new decrees on food hygiene several attempts were made at working out a definition for food safety and the issue was extensively discussed. However, the European Union decided – probably in view of the contradiction inherent in the FAO and WHO definition and the impossibility of its legal enforcement (in that no food that can be proven to be completely safe exists) – to *work out a definition for unsafe food*. The new food law adopted in January 2002 (Article 10 of Regulation (EC) 178/2002 provides that "Food shall not be placed on the market if it is unsafe".

Two criteria are specified in the regulation as the conditions to be met for food to be safe:

- on the one hand, it must not be harmful to human health with a view to continued processing, use and consumption;
- on the other hand, it must not be unsuitable for consumption for any other reason.

The importance of these stipulations lies in the fact that in many cases it would be difficult to scientifically prove that food that is deteriorated, disgusting or otherwise inadequate, is actually harmful to health. In this way, however, it is clear that such products cannot be marketed either.

Ways of achieving food safety

General rules on food hygiene, guidelines, instructions

One characteristic of the second half of the 1990s was that *general food hygiene guidelines* were incorporated in every country's food legislation. These guidelines were applied in an attempt of bringing together all of the general rules ensuring the best ways for establishing and operating food producing plants as well as commercial and catering units. However, it is not possible to work out all regulations on all products in minute detail. Serious mass food infections started out in some cases even from the finest units, kept clean and operated in accordance with the applicable general rules, as a consequence of such minor, seemingly negligible errors, as inadequate washing of hands after cutting poultry or insufficient heat treatment of one or another product. This is what happened in the case of the salmonella infection that broke out in Budapest on 6 June 1996, bringing down some 5,000 children,

landing nearly 1000 children in hospital, causing a disastrous situation in the Hungarian healthcare system.

HACCP system – enforcing the responsibility of the producer

The development and spreading of the *HACCP system* meant a new way towards achieving food safety. HACCP is the acronym of the name of the system in English (*Hazard Analysis and Critical Control Point).* The HACCP system was developed in the 1960s by NASA as part of its space exploration programme, to guarantee complete safety of astronauts' foodstuffs. From this angle the term "hazard" includes any and all contamination, foreign substance (e.g. bacteria, viruses, chemicals, physical contamination) or the condition/state of the food which may entail a potential risk to its consumer.

The HACCP system is a special regime developed for the prevention of health impairment caused by food-borne materials/substances that are harmful to human health. To provide for the safety of foodstuffs it is focused on how hazards come about and how then can be prevented or averted, examining the technology and the circumstances of processing individually (by product and process). In practice, it may be regarded as an individual safety plan concerning the product and/or technology concerned. In the course of its application where food is prepared the critical points of the given product/technology must be identified and the control and actions must be focused on the points so established.

The HACCP method eliminates actions that are carried out only as a matter of routine without actually adding to safety, together with any unnecessary checks, and it focuses attention to the real problems, keeping those steps under control that are really important, the ones that may lead to food-borne diseases in the case of the coincidence of specific circumstances. With its simple, logical and methodical applicability and palpable benefits it was quickly adopted by participants of food production. Its spreading was greatly accelerated by its formal recommendation, and publication among its documents, by the joint FAO–WHO Codex Alimentarius Committee. Thereafter both the European Union and other developed countries integrated it in some ways and to some extent in their own food regulations.

In applying the method, after the description of the attributes of and technological process every single technological step must be examined from the following aspects:

- What realistic hazard (biological, microbiological, chemical or physical) needs to be expected in the case of the given step during the course of preparation (manufacturing) and/or distribution?
- Is this hazard reliably eliminated by any subsequent step of the technology?
- If the hazard is not reliably eliminated by the technology, it must be checked whether the product can still be manufactured by applying supplementary actions and their continuous supervision.
  - If it can, the technological step concerned qualifies as a critical control point where continuous control must be provided for. In this case the control parameters of safe production must be established for these critical points, and then kept under continuous surveillance.
  - If this is not possible, the manufacture of the product must be abandoned because it cannot be safely produced.

The system also includes a registry of the checks carried out on the critical control points, certification of the adequate functioning of the systems and the provision of the employees with the necessary training.

Decision-making based on risk evaluation

Given the fact that food safety is, in terms of its purpose, a matter of human health, it must also be noted that health safety entail very substantial *economic implications* as well. As a consequence of the growth of world trade, and globalization, the free movement of goods has also been expanding to a global scale. The World Trade Organization *WTO* stipulates that the freedom of movement of goods may only be restricted on the basis of sound, scientifically validated reasons (WTO, 1995). Such reason may be found with the help of risk analysis.

The basic documents of risk analysis were worked out by the FAO–WHO Codex Alimentarius. Risk is a function of the likelihood of the occurrence of an effect causing health impairment, that is the consequence of a hazard, and of the gravity of the effect. It should be emphasized in relation to the definition that the process of risk analysis for food safety that it may only be interpreted with a view to the prevention of health impairment – as the most important goal – while taking into account the realistic possibilities and the requisites of feasibility.

Risk analysis is a combination of the closely integrated constituent (part) processes of risk assessment, risk management and risk communication. These are often supplemented by a fourth influencing factor: that of consumer risk perception. The processes of risk assessment, risk management and risk communication are summed up in Table 2. Consumer risk perception is not officially a part of risk analysis under the Codex system, therefore it is not included in the table. The part processes are not sharply separated from each other.

Table 2

Processes constituting risk analysis

Risk assessment	Risk management	Risk communication
Hazard identification	Risk identification	Between risk assessment and risk management officers
Hazard description	Review of possible alternatives of responding to the risk	With a wider range of stakeholders
Assessment of exposure to hazard	Execution of chosen alternative	With consumers (with the involvement of the media)
Description of risk	Monitoring of execution and review of effectiveness/efficiency	Feedback to government

Source: Szeitzné Szabó, 2000

Risk assessment

Risk assessment must be based purely on scientific knowledge; it cannot be affected by industrial, commercial, governmental or market protection interests. Its aim is to establish the extent to which the hazard concerned (e.g. bacteria, chemical) is present in the food and what degree and extent (acute, sub-acute or chronic) risk it poses to the population depending on the amount of the food consumed. The result of the risk assessment may – ideally – enable the establishment of that amount of the material concerned (hazard) that does not lead to health impairment, even if consumed regularly in the long run. If no such threshold can be established, the risk assessor explores quantity relationships between the extent of the hazard present in the food concerned and the consequential health effects. It is an international requirement that scientific risk assessment must be independent, and separated from risk management.

Risk management

Risk management is the entirety of all activities aimed at preventing, eliminating or mitigating the identified risk. Risk management tools include the introduction of legal regulations, the setting of thresholds and limits, the operation of a control networks, imposing obligations to perform itemized checks and, in the case of acute danger the blocking and destruction of products, together with the introduction of other actions by authorities. The list of possible actions that could be applied has to be reviewed and then the most suitable one have to be implemented. The effectiveness of the selected option(s) has/have to be monitored and, if necessary, changes have to be made. In this process the various influencing factors must already be taken into account, together with the conditions and requisites for the performance of the actions, their likely effects and their costs, and the society's resources and capacities. Risk management is primarily a governmental task but managers of food businesses also play a major role in it, through the effective operation of internal controls and full compliance with the applicable regulations.

Risk communication

Risk communication ensures the necessary flows of information and the contacts among organizations, institutions and persons in any way involved in or affected by the risks concerned. Rather than being a one-way process, it is an interactive exchange of information and opinions, concerning hazards and risks, the possibilities of mitigating risks, among risk assessors, risk managers, consumers, food processing and feed producing businesses, the scientific community and other stakeholders. Accordingly the process of risk communication involves scientific consultants, decision makers (government, central authorities), those implementing decisions (regional bodies of authorities, laboratories), those affected by decisions (industry, trade, catering) and consumers, usually attracting extensive media coverage.

Risk communication has become an at least as important element of the risk analysis process, as are risk assessment and risk management, from which it is not separable (Figure

5). For this reason, instead of the conventional three interlinked circles (on the left hand side of the figure) this system is illustrated showing up risk communication as fully embracing the entire process (as is presented on the right hand side of the figure).

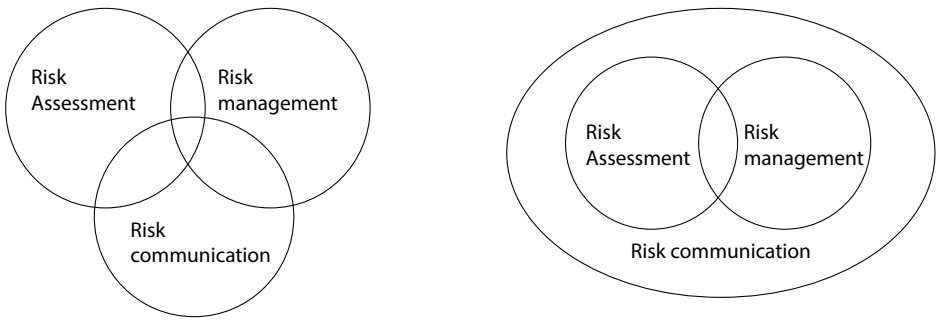

Figure 5

Relationships among the processes involved in risk analysis

Source: Szeitzné Szabó, 2000

Consumer risk perception

Consumers' risk perception has been changing; people are growing increasingly concerned about food safety. The provision of scientifically sound information, if properly carried out, may make valuable contributions to raising society's food safety culture, to raising the standards of food safety and to reducing food-borne diseases. Information withheld, or mistakes in the communication of information however, make consumers uncertain and, by triggering panic responses, it may lead to the immediate loss or collapse of the product's or producer's market. Consumers' growing concern and distrust is clearly indicated by the findings of public opinion surveys.

According to *Eurobarometer 49 Food Safety* the majority (68%) of consumers in the European Union have concerns about food safety. As regards the credibility of the information supplied to them, consumers trust consumer protection organizations the most (one in every two consumers). One in five consumers trusts their national governments and one in five believes what the EU institutions have to say to them. Food producers are regarded to be the least trustworthy (one in eight believes them) since people are convinced that they are more interested in selling their products than in making them safe. Consumer opinion is something decision makers cannot afford to disregard. This is because consumers are at the same time voters when it comes to elections; by casting their votes they make sure that the government in office cannot forget that if it wishes to continue in office it has to respect what consumers want.

The authority's role in maintaining the safety of the food chain

Food safety – which, in the broader sense of the term, comprises also the actions to be taken across the entire food chain to ensure the safety of the end product – is one of the few functions over which comprehensive, regular and tight EU and national supervision and control is exercised, one that is nearly entirely governed at an EU level, by regulations. The system of food chain control has undergone major changes in Hungary. Year 2003 saw the establishment of the Hungarian Food Safety Office (HFSO), whose key tasks – besides risk assessment at a national level – included the coordination of the system of institutions involved in various specific fields of food control, operating under the supervision of different ministries. Hungary's EU accession was followed in 2007 by the closure, transformation and/or merger into the Central Agricultural Office (CAO), of institutions dating back to decades, or even a century or so. The two institutions were merged in 2012 to create what is now called the National Food Chain Safety Office (NFCSO), overseeing the entire food chain in Hungary, together with even other areas that are only indirectly linked to the food chain, performing the tasks of the competent authority regarding the controlling of the food chain, in cooperation with the competent departments of the regional government offices. Regular on-site checks of the adequacy of controls exercised by national authorities are carried out from time to time by the European Union's competent office, the *Food and Veterinary Office* (FVO).

RASFF system

Close cooperation among member states is enabled by the *Rapid Alert System for Food and Feed (RASFF)*. The RASFF was put in place by the Union's food law, Regulation (EC) 178/2002. All of the existing member states, the European Commission, particularly its directorate general in charge of food safety and consumer protection (DG SANTE), the European Food Safety Authority (EFSA), and the member states of the European Free Trade Association (Iceland, Liechtenstein, Norway and Switzerland) participate in the system. In every Member State one institution (national contact point) was designated. The centre of the RASFF system in Hungary is the National Food Chain Safety Office, performing on-duty service tasks and those of being in readiness, in a 24 hours/7 days system.

The system is in place for receiving notifications of actual or potential health risks entailed by food or feed products, where it is possible that the product has been transported to other member states as well, or the notification may carry valuable information for other member states for any reason. Four types of notification may be made: alarm, information notification, border rejection notification and news. An alarm is sent when the authority has detected a major hazard, the product concerned is on the market and immediate action is required. The adequate operation of the tracing systems plays a particular role in the investigation of cases. This is because every food industry undertaking is obliged to operate a tracing system, that is, to keep records of every product delivered to and from its premises. Even so, it often takes a long time for identifying the movements of a given product through multiple stages of processing and transports, as a consequence of the complexity of the food chain.

Since the system has been put in place to keep tracks of and to enable the withdrawal of products that are potentially harmful to human health, the creation of a separate network for the investigation of fraud and counterfeiting, with no immediate hazard to human health, is in progress.

Intentional food contamination, counterfeiting and fraud

While the authority's controlling activities are in place primarily to monitor officially operating businesses, their compliance with the applicable statutory regulations, and known risks, detecting and investigating deliberate covert and illegal activities is a specific challenge and is not part of the daily routine. In this case the tasks are shared by criminal investigation authorities, tax and customs authorities and food control.

Deliberate actions may be categorized as follows:
1. Food counterfeiting, fraud
Food counterfeiting and fraud is manipulation of foodstuffs, exclusively for illegal *gain.* While doing so*, the perpetrator endangers life and health* but that is not his goal; that is only a "side effect" not intended even by the perpetrator, because it draws attention to his activity. Today, however such "side effects" may endanger large numbers of people. Recent cases of food contamination have proven that contaminated foodstuffs may be quickly delivered to markets all over the world, it may be incorporated in a great variety of other products and then make large numbers of people ill. Some 20,000 people got sick and 800 died after the use of "bleached" industrial oil sold for cooking oil in 1981 in Spain. A milk-based baby food product contaminated with melamine made some 300,000 children sick in 2008 in China. One example from Hungary was a case of domestic ground paprika contaminated with a lead-containing paint, which got entire families to hospital with lead poisoning. There are cases of counterfeiting that cause only *economic damage* through reduced quality, or undermine a company's good reputation. Such cases include re-labelling, re-packaging and the sale of a product of inferior quality as a premium product, or the sale of conventionally produced product as organic food. One domestic example of this kind of fraud was the sale of pork, after artificial colouring, for tenderloin, some of which even made it to foreign markets.

2. Intentional food contamination
In the case of intentional food contamination the perpetrator's definite purpose is to have the product *make the consumer sick*. This category includes cases motivated by political, religious or moral conviction along criminal acts committed for other, individual motives. Malicious food contamination is a practice with a long history, as is indicated by the expression *food poisoning,* which is still commonly used for all food-borne diseases. Poisoning food and drinks could be family dramas and criminal acts affecting a handful of people, but this kind of poisoning has, from the very beginning, been also practised for political ends. It was not a simple coincidence that food tasters were to be found in all rulers courts in the middle ages. Opponents at war often resorted to destroying each other's livestock or crops,

poisoning wells, springs or food resources. Such news and accusations are to be found on the world wide web even today.

3. Food-terrorism

According to the definition adopted by the World Health Organization food terrorism is "an act or threat of deliberate contamination of food or water for human consumption with chemical, biological or radionuclear agents for the purpose of causing injury or death to civilian populations and/or disrupting social, economic or political stability" (WHO, 2002: 1.). The threat of food terrorism exists today as well. On 17th January 2002 the WHO Executive Board adopted a resolution (EB 109.R5), recognising the importance of protecting the safety of foodstuffs as part of the wide response to be made against malicious and harmful use of biological, chemical and radioactive materials.

The WHO warned that the deliberate contamination of foodstuffs by terrorists is a real and present treat and contamination at any point of the food chain may result in extensive, even global, health consequences. Such threats today are of an even higher scale than before, due to mass production and global trade. Technical possibilities have also become much more advanced and poisonous and infectious substances and materials are now very easy to come by or produce. Such substances can be accessed via the internet, where all of the information required for would-be perpetrators is also readily available. The perpetrator's intent is generally still hidden when the infection or poisoning occurs, or at the time of its threat – this can only be clarified by investigations or the perpetrator's admission, or reports received by the authorities concerned.

Terrorism itself is usually politically motivated, but sometimes there are other causes (e.g. religious motives). Food terrorism is rarely driven by political motives, but products of a chain store or a food manufacturer are more likely to be poisoned – or such threats are made – causing major economic and moral damage and potentially even panic among the population. Threats or endangering are increasingly frequently motivated by blackmailing, the intent to take vengeance, but these may even be acts caused by lone individuals with mental problems.

Entire food product lots or deliveries are difficult to infect or poison, therefore the likelihood of such an occurrence is relatively low. Possible acts of food terrorism are nonetheless of outstanding importance because besides causing acute disease such acts may threaten with the escalation of food scarcity to serious scales (CDC, 2000). Panic may also be caused when only part of the food supplies is endangered but the potentially infected or poisoned product or lot cannot be identified so consumers reject all similar products. Targeted acts of terrorism may even be aimed at livestock, arable lands or feed and jeopardize food supplies by triggering epidemics in livestock or destroying crops.

As for the procedure and protection, similar methods need to be applied for the prevention, investigation and termination of all kind of deliberate cases of contamination. For this reason, all cases of intentional food contamination must be regarded as food terrorism, from a technical/professional aspect. Governments and food industry enterprises alike, must get prepared for preventing and averting the possibility of intentional food contamination. The vulnerabilities of infrastructure systems and businesses must be assessed and then action plans and communication plans must be prepared and rehearsed in simulation exercises in case a crisis develops.

Preparations for countering food-terrorism

Each of the government, international organizations and food industry enterprises should have its own specific set of tasks in the preparations.

The conditions and requisites for effective *governmental preparations and defence* include:

- Strong and properly functioning public health system, in close cooperation with the curative network;
- Effective surveillance system incorporating elements of symptomatic surveillance.
- Strong and properly functioning food chain control system that is also prepared for taking actions in case of emergency as well.
- Well-prepared laboratory system that is capable of detecting rarely encountered pathogens and chemicals that are not normally present in foodstuffs and of simultaneous processing of large numbers of samples, and that is connected to the rapid alarm system.
- Extensive cooperation across food chain controlling and health organizations, as well as other (disaster management, criminal, agricultural, environmental etc.) authorities and organizations concerned.

As for the activities of *international organizations* mention must be made of the WHO recommendation (2002), according to which the hazard of deliberate infection and poisoning of foodstuffs may be alleviated by adhering to the rules of the good practice relating to the operation of food safety systems, but the possibility of a deliberate threat requires specific consideration and analysis. To ensure quick communication on food safety incidents the WHO is operating a global system called *INFOSAN Emergency.* Its contact point in Hungary is the National Food Chain Safety Office. At an European level the aforementioned rapid alarm system called RASFF is also in place for immediate communication concerning food contamination or infection.

Food defence is part of the responsibilities of businesses. Due to the nature of the problem the use of the current technologies applied in the area of primary food production and processing and the tools available for prevention does not result in complete safety from intentional food infections and contaminations. Every unit, particularly large enterprises engaged in the production and marketing of food products and units of outstanding importance from the aspect of critical infrastructure must get prepared for such occurrences. They must work out preparation plans for the prevention of occurrences, together with action and communication plans setting out tasks to be carried out in crisis situations, to prevent or respond to panic.

General food safety considerations must be part of the attention paid to the threat of deliberately caused infection and poisoning. The methodical approach to be chosen should include an analysis of the main phases of production from raw materials up to the end user, with a view to the possibility of threats that may be caused deliberately. Making operations safer and the performance of more effective and efficient quality controls is highly likely to be capable of reducing the possibility of deliberate infection/poisoning with the help of the preventive systems, which will thus be more difficult to interfere with and by which the likelihood of detection will be higher.

The key elements of the food defence plan

To enhance safety the WHO recommends the application of the following actions that can be integrated in the general food safety systems in the area of food production and marketing:

- preparation of special safety plans in which the points in the product chain that are most exposed to deliberate contamination are analyzed;
- obtaining a reasonable quantity of information on the origin, storage and transport of the raw materials delivered to the company, checking the integrity of the packaging upon receipt of delivery;
- restriction of documentation of access to places regarded as critical from the aspect of terrorist acts, including manufacture, storage and transport;
- closing processes of production to the extent possible, and as reasonable from the aspect of technologies and hygiene;
- employment in production of staff with adequate qualifications for the tasks to be carried out, who are provided with adequate training and controlled to the extent necessary and possible;
- monitoring of other persons (internal and external) accessing the areas of production, prominent identification and accompanying of persons on the premises;
- choice and use of packaging that indicates unauthorized opening, together with impairments;
- introduction and operation of an effective product withdrawal system;
- ensuring product traceability across the whole of the production chain, facilitating product withdrawal and the investigation of the origins of suspicious lots/batches or input materials;
- In addition to the above actions consideration must be given to all reasonable possibilities for minimising the hazard of subsequent infection/poisoning of the finished product.

The majority of these actions have already been integrated in good manufacturing practices and internal quality management systems (e.g. ISO 22000) applied at multiple factories.

Actions proposed to take in the case of an occurrence

Preparations must be made to the unwelcome case of the food chain or any of its elements being actually attacked or any food product being intentionally contaminated or infected.

1. Preparation of action plan
A business should prepare a detailed action plan covering all material aspects, setting out tasks to be carried out upon a suspected case of deliberate infection/contamination of its products. The plan must include prompt actions to be carried out concerning the lot/batch concerned (blocking, separation), checking the information received, organization of the process of product withdrawal if necessary, notification of the authorities and information of the media. It is key that persons responsible for the performance of each of the envisaged activities be identified and appointed.

Active cooperation with the authorities should also be regulated as part of the disaster response/recovery plan. Threats and suspicious activities must be notified to the competent authorities and the national security organizations. Efficient and quick exchange of information with the authorities should be organized in order to enable the blocking of the entire quantity of the endangered food product as quickly as possible on the basis of adequate assessment of the evidence and risks. The authorities themselves must also prepare their own crisis management and communication plans, including tasks to be carried out in relation to such situations, and keep such plans up-to-date through regular exercises.

2. Consumers' role in case of suspicion of deliberately caused food safety hazards
Consumers also have a role in detecting and notifying deliberate or accidental contamination. If the packaging of a product is not unimpaired or if its external appearance, smell or taste differs is other than it is normally, it must not be consumed. If the product is suspected to have been tampered with, the retailer or the supplier, as well as the competent public health authority and the criminal investigation authority must be notified.

3. Communication in the case of a threat
Communication with the media and the public is expected from the government, the producer and the distributor alike, to enable the management of concerns and any rumour. Panic and hysteria may have much more serious consequences to healthcare sector, industry or trade than the actual terrorist threat itself. On the other hand, hiding information from the public may result in loss of confidence in the government, public authorities and the producer/distributor. In view of the above, no effort must be spared to make sure that information be comprehensive and honest.

Worries about terrorist attacks and the risks of unfounded rumours must also be taken into account in the management and communication of the threat/emergency. The sense of being threatened is likely to linger on for quite a while after the occurrence, whether or not it was followed by diseases. For the delivery of his "message" the perpetrator may find it more important to disrupt public life and the day-to-day routines of the population than the number of people actually infected or poisoned. Accordingly, efforts must be made during communication to make sure that the provision of information is not turned unintentionally into a means promoting the terrorists' goals. Such communication methods must be elaborated and applied that provide the necessary information as required for public safety but cannot contribute to raising panic.

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II.

THE SECURITY CHALLENGES OF STRATEGIC FORECASTS

Erzsébet Nováky – Andrea S. Gubik

Handling Uncertainty in Futures Studies

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Abstract

Futures studies deals with processes that have not yet occurred, have not yet developed or do not even exist. Uncertainty is necessarily an essential element in the study of the future and also in futures studies. Uncertainty cannot be eliminated, just mitigated. This study aims to explore the interconnection existing between futures studies and uncertainty from several aspects (dual uncertainty, determination, chance, unexpectedness, information, stability, instability).

This study also shows how uncertainty can be reduced by reasonably applying and combining methodological principles of futures studies (for example, complexity, participatory, alternativity), by identifying and managing unstable situations, as well as by identifying weak signals and wild cards (low-probability, high-impact events) and incorporating them in forecasting/foresight. Focusing on actual forecasts/foresights and practical examples, this study attempts to contribute to understanding how the continuously existing uncertainty about what the future will hold can be reduced through a conscious use of these principles and methods.

Keywords: Futures Studies, uncertainty, certainty, security, chance/unexpected, stability, instability, chaos theory, weak signals, wild cards

Foreword

Uncertainty is necessarily an essential element in the study of the future and also in futures studies. If we associate security with the future, then, first of all, we face a vision of uncertainty on account of the open nature of the future. That a futures researcher can seldom tell the future with certainty, or, in other words, can seldom make a prediction – that is, a single version of the future that is the most probable to occur – is rooted, first and foremost, in the mutability and instability of our world. The present can shape the future in many ways, and the future may have favourable as well as unfavourable, even disastrous

versions. Futures research attempts to mitigate this uncertainty, even though it cannot be eliminated completely.

In terms of our study, *certainty and safety can be interpreted as mitigation/diminishing of uncertainty related to the future*. In this interpretation, dealing consciously with the future in the form of futures studies assists the players of the society and economy greatly in formulating a sustainable strategy that responds forecasted changes affecting their future, and helps them to act accordingly. In this way, they create a solid foundation for mitigating uncertainty and increasing safety.

Futures studies and uncertainty[1]

Dual uncertainty

Uncertainty manifests itself in futures studies in a dual form: as ontological and gnoseological uncertainty. Uncertainty stems, in part, from the fact that in the present we are unable to tell exactly which of the possible alternative futures will come to pass: this is the root cause of *ontological uncertainty*. Often we are even unable to say with a high degree of certainty which version of the future is the most likely to take shape. Also, our knowledge of the future is also uncertain as we cannot tell exactly how extensive our entire knowledge pertaining to the future is, and we find it difficult even to tell how much of the future we have already covered with our knowledge – this is the root cause of *gnoseological uncertainty*. The fact that there is value attached to the development of possible alternative futures further increases uncertainty. However, sometimes it can also reduce uncertainty if we manage to approach the future in an actively future-oriented and positive way.

When dealing with the past (in history and archaeology), the uncertainty factor is only gnoseological. Events that happened, processes that came to an end and established conditions are solidified as part of recorded history. Thus their existence is a given fact. The only source of uncertainty in their case is that our knowledge of them is never complete, and often we re-evaluate not only the future but also the past: in part, when new information becomes available, and in part, because we ask questions arising from different contexts about the past in order to address our problems in the present and the future. And we usually get different answers to different questions.

Outside futures studies, dual uncertainty is also present in other scientific disciplines. It is also a characteristic feature of scientific disciplines that are relatively independent of the passage of time. For example, since the discovery of Heisenberg's uncertainty principle it has become evident in modern physics that the subject of its studies is phenomena that have probabilities and are shaped in the experiment by the interaction of the object and subject (observer). Thus the relevant laws are statistical laws. We can find similar situations in biology, psychology and social sciences. As regards society, the special form of interaction between object and subject in connection with the future stems from the fact that due to their purposeful activity, humans can influence the anticipated or previously assumed future.

[1] This part of the study is mostly taken from the article of Erzsébet Nováky, entitled *Jövőkutatás és a biztonság* (Futures Studies and Security) (Nováky, 2011).

In futures studies, emphasizing dual uncertainty is especially warranted because this is the reason why the possibility of studying the future with scientific methods is doubted by many. However, as we have shown it, it is not an exclusive feature of dealing with the future. In regard to futures studies, there are two things that follow from this: on the one hand, the *future can only be studied on the basis of probabilities*, and on the other hand, *proving and verifying statements based on knowledge of the future is a special process as it only ends when the future becomes the past*.

Uncertainty will necessarily appear in dealing with the future. The subject of futures studies is a domain and a perception of the future which is always related to the actions of the people and the society affecting the future as well as the scope of those actions and the overarching correlations between them. For this reason, the subject of futures studies is the changes in the slices of reality containing the human element – complexities that take shape along the Homo sapiens line (Mannermaa, 1991) – over time as well as their determination, mutability and shapeability. This fact excludes regular recurrence and immutability, and substitutes them with renewal, change, and often unpredictability.

Uncertainty manifests itself in different ways in the various domains of the future. In the basic future domain called constant future (Doxiadis, 1972) appears the part of the future which remains relatively unchanged from the past, and for this reason we have a great chance to make a prediction in regard to its emergence, which means that it is not particularly characterized by objective uncertainty. The domain of the declining future consists of phenomena and processes that gradually cease to exist during the forecasting period – for example, individuals in the current population or fauna –, and as a result, the domain of the declining future does not carry any significant uncertainties. Components of the continuing future are reproduced in some form, which ensures their survival, however reproduction may also introduce certain new attributes. It is another important domain of the future that is mainly characterized by quantitative changes, and where objective and subjective uncertainty equally arise. The most uncertain future is the one created and represented by newly emerging or produced elements with qualities that differ from those they possess in the present or possessed in the past (so-called creative future). This domain of the future is characterized not only by ontological but gnoseological uncertainty. Its proportion to the other domains is a key indicator of a society's ability to evolve and its creative power.

Uncertainty and determination

Uncertainty of the future is also a result of the fact that *it is always the resultant of a combination of various determinants – causal, statistical, teleological, and dialectical*. For a long time it was believed that only phenomena determined in the Laplacian sense (clearly calculable in advance) could be forecasted. However, the world does not work like a Laplacian daemon and yet it is still possible to forecast future events and trends in several alternative versions. In order to achieve this goal, futures studies resorts to applying deterministic chaos theory to instable systems. In futures studies involving human elements, the laws of statistics are the most useful for detecting objective and subjective uncertainty. These laws do not allow us to determine events and trends in detail, but they can help us to explore and forecast common characteristics and attributes that can be generalized. They also indicate

the general trend and the interval limits (probability limits) between which the examined phenomenon will probably occur. Thus they provide a complete arsenal of methodologies for dealing with both forms of uncertainty and their sources.

Differences in the determination of the past, the present, and the future. The past is final and unchangeable, the present is determined to a great extent, and the future is determined only in regard to its main trends and general characteristics. Future reality is not determined in its details, but as a totality. How and in what form will one of the several possibilities be realized within the interval between the limits of probabilities without violating the general characteristics of the future depends on the resultant of various interactions. This is how the probabilistic nature of the future can be interpreted. When certain objective conditions are met, only a single version of the future is realized, the probability of which lies within the [0,1] interval and indicates the probability of the future to become reality. This correlation can be applied to the description of single possible futures, because the only difference between futures that come to pass and possible futures is in their probability. The impact of multiple possible futures on probability is reflected in the fact that the processes connecting the past, the present, and the future still point to multiple outcomes at the time (during the period) of the preliminary observation, and the strength of the interaction between the processes determining the individual outcomes varies. A process may have multiple evolution tendencies or future states because none of the possible evolution tendencies or future states carries such a strong genetic determinant force and relationship in itself that it could ensure a predetermined outcome of the process. This means that the possibility and probability of future changes are determined by the nature of correlations between the past, the present, and the future. The different degrees of stability and strength of these correlations provide the basis of the different probabilities of these futures.

In this way, in futures studies the *ontological meaning of probability,* indicating that probability expresses how great the chance of a process or phenomenon to exist, decay, or come into being is, appears. In this case, the emphasis is on the uncertainty related to the object. In addition, *futures studies* (considering that it is a mental, noetic activity) *includes the gnoseological meaning of probability too.* In the gnoseological meaning of the notion of probability, probability refers to probabilistic statements related to knowledge or, in other words, the indetermination (uncertainty) of knowledge about a certain object. The ontological and gnoseological meaning of probability are intertwined with the two components of the so-called dual uncertainty.

Chance, unexpectedness, uncertainty

In the emergence of future uncertainties, chance has a key role. Chance, unexpectedness, and uncertainty are not the same notion since "unexpectedness is a characteristic of a random event, while uncertainty is linked to a random variable" (Rényi, 1976: 54.). The probability of an event occurring (p), its uncertainty (h[p]) and unexpectedness (v[p]) are correlated. Uncertainty depends on the unexpectedness of events and the probability of their occurrence.

As regards the relationship between unexpectedness and uncertainty, out of the probability values of the occurrence of an event, three are worth mentioning. If the probability

of occurrence is 0.5, then the value of uncertainty and unexpectedness is 1, which means that the most uncertain and unexpected events is the one that is as likely to occur as not to occur. If the probability of occurrence converges to 1, then unexpectedness and uncertainty converge to 0. If the value of probability is 1, uncertainty becomes uninterpretable. If the value of probability is 0, then unexpectedness converges to infinity, while uncertainty to 0. Therefore, uncertainty is the greatest when probability is equal to 0.5, and it decreases to 0 as the probability value decreases (or rises). Unexpectedness is reduced as the probability of occurrence increases, and when the latter decreases, its value grows without limit. *The lower the probability of an event to occur, the higher its unexpectedness is. And the higher the probability of an event, the less unexpected it is.* Examining uncertainty and unexpectedness in the [0.5;1] interval we can draw the conclusion that increasing the probability of occurrence will cause unexpectedness to drop more quickly in the first half of the interval than uncertainty. Thus, an increase of probability has a greater impact on the reduction of unexpectedness – in this interval section – than on uncertainty.

Environmental disasters and general uncertainty brought low-probability (<0.5) events into focus that emerge suddenly and have a great impact on the society. As discussed above, the unexpectedness of these events is high. In general, the society has difficulty preparing for such contingencies, and subsequent remedial activities may take a long time (for example, the consequences of the nuclear disaster that occurred at the Chernobyl nuclear power plant in 1986 still linger). Low-probability events are paradoxical in that unexpectedness may be reduced by increasing their probability to occur. However, this might not be desirable, especially in the case of incidents having a huge adverse impact on the society. An increase of the probability of occurrence also entails an increase in uncertainty in the [0; 0.5] interval, which leads to loss of information. The closer the occurrence value gets to 0.5, the closer the probability of occurrence and non-occurrence of the event converges. Thus, we have less information about whether or not the even will occur. By reducing uncertainty, we could get more information, however, due to the characteristics of the interval, it is only possible by reducing the probability of occurrence. A lower probability of occurrence will also increase the value of unexpectedness, and as a result we come full circle.

Uncertainty and information, stability and instability

The correlation between uncertainty and the volume of information is characterized by the statement that "a reduction of uncertainty can always be interpreted as information" (Rényi, 1976: 56.). In contrast, changes in unexpectedness cannot be regarded as information: only the expected value of unexpectedness represents information. However, it is the same as a reduction in uncertainty. Information related uncertainty can be rated according to the below grades on the "uncertainty scale" (Kaufmann, 1982: 168.):

- unstructured uncertainty: the states of the system are unknown at any point in time other than the current one,
- structured uncertainty means that the states of the system are known, but it is not possible to predict the state of the system,

- chance means that not only the states of the system are known, but its probabilistic principles too, which characterize a point in time other than the current, but the actual outcome of the event is unknown,
- certainty means that the states are known and they can be described at any point in time.

A good example of unstructured uncertainty in the society is the number of cars travelling on the roads of the country. Economic phenomena and processes are mostly characterized by structured uncertainties, while chance plays a role in most of the societal processes and certainty in the malfunction of technological equipment. When making forecasts regarding the society as a complex system, events and correlations will appear everywhere across the uncertainty scale. As the volume and quality of information increases and our knowledge of unknown phenomena improves, we can progress across this hierarchical scale. If structured uncertainty is properly specified, using statistical principles we can progress to level three. Applicability of deterministic hypotheses allows for stepping up to the highest level. Of course, it is only applicable to stable systems.

Uncertainty under stable conditions – when uncertainty is properly structured – can be effectively mitigated by the increasing volume of information. *Under unstable conditions*, however, this is not the case because uncertainty is an inherent property of instable system, which cannot be reduced by increasing the amount of information. A lot of unstructured uncertainties can be detected in the society and the economy, however, they can be managed more or less by extending our knowledge of the unknown.

Reducing uncertainty also reduces risk as the latter covers a set of uncertainty factors the probability of which can be inferred and estimated. Risk are associated with actions the results of which are always seen as negative but they have not come to pass yet even though they might in the near or distant future, which means that their occurrence is uncertain. Therefore risk can be seen as a measurable part of uncertainty according to the interpretation of Knight and Keynes (Knight, 1921; Keynes, 1921) so statistical methods can be developed to measure it. If probability distributions and expected values are known, then the behaviour can be described with functions, and the measure of risk can be approximated with a distribution or variance value.

We encounter risks and efforts to deal with them almost everywhere. The notion of economic risk is usually associated with corporate activities, while attention to environmental risks was drawn by adverse effects produced by large technological facilities and the fear of new ones. There are other types of risks such as political, social, genetical, and medical risks that can be mitigated to a varying degree through making forecasts. Applied statistical solutions are suitable for revealing existing trends and making forecasts based on them, but they cannot handle weak signals and wildcards. These can break trends or create new ones, and for this reason forecasts solely based on statistical methods can be erroneous even if they include several alternative futures.

Methodologies and tools of futures studies reducing uncertainty

Futures studies is meant to reduce uncertainty. Future studies may be used to mitigate, on the one hand, objective uncertainties related to processes, events, correlations, and states that do not exist yet but are expected to emerge in time, and, on the other hand, subjective uncertainties based on knowledge that can be gained about the changes. Futures studies and their results influence our actions and decisions today, and they help us to investigate the effects of our previous decisions. As part of this process, futures studies may intensify the future orientation of experts and laymen studying the future as well as individuals and groups involved in and affected by decision-making, increasing the certainty of future development of certain topics of the future.

Principles of methodologies in futures studies

In order to reduce uncertainty and to improve safety, we can invoke three interrelated principles from the methodology of futures studies: complexity, participativity, and alternativity. Why do these three principles reduce uncertainty and increase safety?

Complexity plays a positive role in reducing uncertainty because researchers engaged in futures studies who employ it add several – in fact, as many as possible – facets of reality to their investigations. In this way they can ensure that none of the key determinants of the future are omitted so the scope of knowledge obtained can be more or less comprehensive. Complexity can also save researchers of the future from studying only the elements of the future that look important in the present, ignoring the investigation of the future development of phenomena that are seen as weak signals (Veigl, 2010) at the time. Thus, applying the complexity approach also ensures that futures researchers can analyze phenomena not only from the perspective of the present but also of the future. Only by applying the principle of complexity can the modes of action and interaction between phenomena and future domains be explored as fully and thoroughly as possible.

When invoking the principle of *participativity,* futures researchers engage the population, the laymen, and the interested and affected parties in the development alternative futures. Ensuring that as many of them as possible are actively participating is especially important when dealing with significant changes in the society and unstable socio-economic processes. In such situations, individuals as well as communities recognize that they need to actively contribute to the shaping of their own future. By doing so the interested participants can reshape the expert's forecast of the future, and actualize activities that they would also be willing to perform for the future. *Application of participatory futures studies is the new answer to challenges arising from instability.*

The positive impact of participativity can be measured by the reduction of uncertainty, because involving the *stakeholders* invested in a certain set of issues in the development of future alternatives, and later in the decision-making process may provide additional knowledge that can complement the forecasts of futures researchers, and enhance the creative approach to the future. The laymen's opinion may also serve as a check on expert opinions: representatives of scientific disciplines often suffer from "blindness" – they lose themselves

in the details and they fail to spot the turning points that occur as a necessity in the future or changes that the members of the society consider important.

According to the principle of *alternativity*, futures researchers do not outline a single future or vision but different possible scenarios and future alternatives. To formulate them, first we must interpret the double-bind of the present. Consequential futures arising from the past create the initial state or situation that can be modified, shaped, or overridden by expectations and anticipation. In this way future alternatives that take into account both the attributes that can be derived from the past and the requirements of the future can be drawn up.

Applying the principle of alternativity may reduce uncertainty and increase certainty and safety because it offers experts and those who consider shaping the future their duty an area for decision-making and, within that area, room to manoeuvre. This approach can have credibility because in this room to manoeuvre possibilities that can be derived from the past can be balanced against expectations and requirements stated in regard to the future.

The synergy of the three futures methodologies ensures above all the mitigation of uncertainty related to the future and the increase of safety, because it contributes to producing future possibilities (scenarios and alternatives) in many ways and in many versions, with the involvement of the interested parties/stakeholders. This way not only the probability of making a mistake is reduced but there is a chance to outline new futures that represent a different level of quality.

Recognizing and handling unstable states

Unstable states are profoundly different from stable states. In a stable state, using the classic mathematical and statistical methods/procedures of futures studies one can make fairly reliable forecasts (that offer a sound basis for decision and strategy-making), thanks to continuity and, more or less, permanence in the first place. Under unstable conditions different approaches must be found.

If we learn how to handle instability then we will not expect a phenomenon or an event that is in an unstable state to "behave" as if it were stable, but we will understand that *its future is incalculable, but not unpredictable.* Under unstable conditions, a lot of versions of the future/future alternatives can be worked out, because in a badly structured, complex system, a lot of various futures may come to pass. Therefore we should not focus on reducing the number of future versions/future alternatives but rather on exploring the widest range of them. This is absolutely necessary because in an unstable situation the individual elements (phenomena, events, trends) are extremely sensitive to minor changes, and at certain critical points, futures that are markedly different from the previous ones can form as a result of such minor changes, along so-called *bifurcation branches*. If we treated them as components of a stable system, then we would not be able to interpret the new kind of future, the so-called created future that arises from these bifurcation points, and we would lose the possibilities stemming from the fact that a system is in an unstable state.

When dealing with an unstable state *we need to accept the existence of uncertainty*, we need to try to understand it, and we also need to get accustomed to the possibility of facing markedly different new futures. For this reason, efforts should be made to draw up as many

possible or currently not regarded as possible but imaginable future alternatives. Recognition of unstable conditions can reduce uncertainty if we do not squeeze the progression of a phenomenon/process in the future into the Procrustes bed of stability, but handle them in whatever form they emerge. *Reduced uncertainty and a higher degree of certainty can be achieved by treating the extraordinary and the most unexpected elements* (the so-called weak signals and wildcards that we will discuss later) *as an integral part of future alternatives in addition to the clearly observable ones when we make forecasts for a wide range of future alternatives. Application of chaos theory, chaos calculations, and the scenario method in addition to the weak signals and wildcards that are barely recognizable in the present may help us identify and handle unstable states.*

Application of chaos theory to social sciences draws attention to processes and events the behaviour of which is prone to mutability, instability, and chaos where a minor intervention can have a significant effect. The more unstable a system (its components), the less force you need to dislodge it from its current state and vice versa. Due to the workings of the bifurcation force, the direction of change can be positive or negative with the same probability, and the forces set into motion can produce a new state at an exponentially accelerating rate. This is why it is especially important to recognize that we can get into situation fairly quickly in which we will not have any control over the consequences. For this reason, we should be particularly careful when we outline the events triggering the change and when we intervene.

The *scenario method* (Kristóf, 2002) places the emphasis on critically uncertain (unstable) factors, indicating that these are the ones that futures researchers should first and foremost focus on as their development in the future carries a great deal of uncertainty. In order to reduce uncertainty, we need to understand the dynamics and structure of the studied processes.

Recognizing weak signals

Weak signals are signals in the present that are difficult to recognize and, as a result, identify, and the occurrence of which can be barely deduced. Their significance, however, cannot be neglected because they often indicate a new trend as they can trigger a change of trends or contribute to the emergence of completely new trends. A conventional mindset has difficulty grasping them, but future-oriented thinking may help here. In this case, conventional thinking that focuses only on the past and present should be replaced with a future-oriented mindset that is willing to think "outside the box".

As weak signals may trigger significant changes in the future while they remain barely visible, discovering them requires that persons with a future-oriented mindset should look for them consciously. Another difficulty arises from the fact that you can find an uncountable number of signals that may even contradict each other, and it is impossible to determine which of them will be important in the future. To resolve this problem, Kuosa (Kuosa, 2005, referenced by Hiltunen, 2010) suggests that weak signals should be handled as pieces of a puzzle where every piece forms a building block of the whole. Signals that do not fit in to the large picture are invalid, and are not related to the given change but to another one. The solution is, therefore, that the more signals we collect and monitor, the better grasp we

have on whether or not there is a common pattern. This common pattern or change is what we need to evaluate.

Another difficulty with recognizing weak signals is that they are often so unrealistic as a scene from a science fiction movie, or they break an existing trend that we consider such a long-lasting one that we do not question it and therefore we do not take the signal seriously. Remember the views about 3D printing and the recognition of its inherent potential at the end of the 1970s. The technology did exist at the time, but it was in a primitive form, which means that it represented a weak signal. In the same way, the potential of the Internet or the spreading of social media and its influence on the society and economy could not be foreseen in the early 1990s. Just like we (or at least the majority of the population) failed to recognize the significance of these signals, we might also ignore events that are indicative of the future, but today only exist as weak signals. So we should not shrug off signals that seem to be impossible or ridiculous, rather we should address them in a critical and future-oriented manner.

Where can we find weak signals? According to Hiltunen's research (2008), future-oriented persons may mostly find weak signals coming from scientists, futures researchers, colleagues, professional and scientific journals, and papers from research institutions. Depending on the type of weak signal (economic, societal, technological, political, etc.) the sources differ somewhat. A very surprising result of the research, which might not even be valid today, is that the Internet is not a dominant source when one is looking for weak signals. The research did not find any significant differences based on the proportion of personal, online and printed solutions. Some of the interviewed persons emphasized in their responses to open-ended questions that interaction, openness and the discussion of questions are an important part of finding weak signals. They also found that *simultaneous use of multiple sources* that cover different areas of our lives is beneficial to identifying weak signals.

In addition to these sources, we can gather creative and future-oriented ideas from a lot of other places. A number of movies and tales also include future alternatives that could have been identified as weak signals at the time of their release. Remember the perfect humans envisioned in the movie *Gattaca* (with Ethan Hawke, Uma Thurman, and Jude Law, 1997) who were genetically designed to possess excellent capabilities and health thanks to the genetic modifications. The foundations of this technology – the modification of the DNA – already exist today (CRISPR-Cas9 allows for targeted genome editing), although its everyday application may be a bit further down the road. In the same way, electric cars in the movie could be part of our reality, because the technology is already available. Norway pioneers their introduction with a plan that would only allow electric and hydrogen powered cars to be used in road transport from 2025.

Another good example of weak signals is be the movie *Truman Show* (Jim Carrey, 1998), which is about a man who does not know that the world he lives in is an artificially created reality show. Not only did the movie predict the popularity of reality shows that are quite prevalent today, but it also foresaw surveillance activities affecting our everyday lives. We just need to think about click-based advertisements, surveillance cameras and the use of face recognition programs! According to a survey by CSC in 2015, 74% of the retailers in the United Kingdom use various surveillance technologies (big data, face recognition programs, security surveillance).

A further excellent example from the world of fairy tales is *Big Hero 6,* in which the protagonist, a small boy called Hamada Hiro, is helped by a soft, cuddly robot, Baymax, who, as a personal medical assistant, can do body scans, make a diagnosis, and heal illness. The story envisioned the wide-spread adoption of robots, and chiefly the friendly relationship between robots and humans. The list of examples is endless. The morale is that *we need to be open to weak signals, and we should not expect them only from professional sources, but also from other, sometimes surprising fields of our lives.*

Why is it important? Because *recognizing weak signals may reduce uncertainty, and it may also help us pick what appears to be the most suitable one out of the possible strategies.* This may be true for an individual's career-related decision or the shaping of a company's strategy. As early as in the 1970s, Ansoff realized what role weak signals played in corporate strategy making (Ansoff, 1975), and he tried to develop a solution that would allow for drawing up plans even in an uncertain environment. *A proactive approach will not only render the future predictable but also creatable*, because weak signals can be augmented by the faith in their occurrence. Self-fulfilling predictions, as they can change behaviour, can come true, and for this reason desirable signals are worth paying special attention to them.

Wild cards as extraordinary events

A wild card is a possible event the probability of occurrence of which is very low, but its impact is great (Petersen, 1999). You may recognize wild cards from sports. For example, if the winner of a gold prize at the Olympic games is found to have used prohibited drugs, then the silver medallist may suddenly become a gold medallist, or if a sportsman qualifies for the Olympic games or any other respected sports events because one of the higher ranked sportsmen before them withdraws or get disqualified, then the sportsman in question is given a huge opportunity. Unlike a weak signal, a wild card will not necessarily start a new trend that carries the seed of the future, but it is mostly associated with conjecture and opinions. In unstable systems, emergence of wild cards is more likely than in stable systems.

Wild cards can lead to a favourable or unfavourable outcome. An example of the former can be an invention that opens up new perspectives in medical sciences, of the latter an economic crisis that starts unfolding. In addition to their obvious effects, these wild cards might break the current trend, preventing the future that was forecast as probable by mathematical-statistical predictive methods from coming to pass. Using these methods alone cannot yield success. For this reason, it is critical to establish if emergence of wild cards in the future has any visible signs and who are the persons that are sensitive to such signs. When outlining realistic alternative futures, it is surely reasonable to apply to the wisdom of the crowd in addition to employing experts, because the masses can be often more successful in decision making and problem solving (Surowiecki, 2007), and possibly in outlining the future too.

Researchers are divided in regard to the predictability of wild cards. Some believe that there are early warning signs or early indicators (Petersen, 1999; Hiltunen, 2006) that can foreshadow the occurrence of a wild card. We can stumble on such signs when we are looking for weak signals. Others (e.g. Barber, 2006) maintain that wild cards are not indicated by any signs that would leave enough time for preparations. The truth lies probably

somewhere between the two contradicting approaches. In order to reduce the uncertainty of the future, we need to strive to find any possible signals and to take wild cards into account when we draw up scenarios.

When evaluating the effect of wild cards, beyond their predictability, their reversibility is also highlighted, which indicates whether or not it is possible to return to the original trend, and if so, how long it takes. A significant part of the wild cards produce such a profound change that prevents the events from unfolding as they did before. Out of the incidents of the past few years, key examples that clearly indicate the unexpectedness and significance of wild cards include the 9/11 terror attack or the accident at the Fukushima nuclear power plant. Both have a long lasting effect even a long time after their occurrence. A comparable example from our country is the red mud deluge at Ajka.

Today the range of action of wild cards is often global due to the interdependence and strong interrelations. Although the terror attack on 11 September 2001 targeted the United States, security measures were upped at many other airports, indicating that the lessons learned from the incident were taken into consideration by a winder group of actors, and other states have also acted on this wild card to make their future more secure. Fukushima sparked lively debates about nuclear power plants, and increased demand for the use of alternative power sources.

This means that in addition to predicting wild cards another *key issue is whether or not their occurrence is followed by a learning process that can lead to avoiding similar wild cards in the future.* It is also important to ensure that decision makers can see the root causes and intervene at the correct level. For example, if there are wildfires due to extreme drought (this is a wild card), it is not necessarily enough to rethink strategies aimed at successful firefighting (where to place firefighting stations, how much equipment they need, etc.), it is conceivable that the root cause, the climate change-induced warming should be regarded as an omen.

The notion of wild cards is similar in many ways to the *black swan phenomenon* introduced by Nassim Nicholas Taleb (Taleb, 2007). In his book, the author described the black swan with three characteristics. The first one is that the event is an *outlier*, which means that it falls outside the scope of usual expectation. The second characteristic is that they have a significant impact, the third is that after their occurrence it is possible to come up with a clear explanation of their root causes, which makes them explicable and predictable. Black swan phenomena go beyond (normal) expectations related to science, finances, and technology. Their probability of occurrence (statistical, econometric) cannot be calculated with scientific methods, we cannot predict them by monitoring previous trends. Understanding of black swan phenomena is made difficult by the fact that individuals as well as groups tend to be blinded by psychological preconceptions regarding uncertainty and the role that rare events played in past occurrences, often underestimating chance and luck when they analyze incidents. The same characteristics are also applicable to wild cards.

Practical means of reducing uncertainty related to the future

Literature in futures studies has put forward numerous examples to demonstrate that the principles and tools of futures studies can be used to reduce uncertainty. Here we will

highlight two approaches from Hungarian research projects: the results of research related to the use of modern futures research methodologies and chaos theory/chaos calculations. We will review the results of two Hungarian research projects (these were led by Erzsébet Nováky in the capacity of project leader and we will show the results that can be achieved by applying the principles of complexity, participativity, and alternativity to the reduction of uncertainty in the future and to extend the scope of future alternatives. In regard to the application of weak signals and wild cards, we will use examples taken from literature and practice to demonstrate that they can be recognized in many areas.

Application of principles used in futures research methodologies

We will demonstrate the practical application of principles used in futures research methodologies in connection with a specific forecasting task – a research project aimed at forecasting the societal-economic state of Hungary in 2025 (Nováky, 2010). According to the principle of *complexity*, in the academic research project entitled *Magyarország 2025-ben* (Hungary in 2025) we strived to scrutinize as many facets of reality as possible and look for the possibility of changes at the widest possible level. Topics dealing with demographic, societal, economic, technical/technological, environmental, and settlements related issues were also part of the analysis. We put a special emphasis on studying areas that are subject to rapid changes, and therefore can initiate new processes within a relative short period of time. It is important to learn how experts view the future development of these areas and whether new phenomena that may break existing tendencies and reinforce cooperation and coordination between these areas will appear.

We looked for changes that we have or can have a strong influence on and we can and/or we want to influence. These include population, healthcare and nutrition, fitness, mental disorders, education, sustainable households, crime and law enforcement, social governance and public administration, and settlement development. The Hungarian population's power to shape its future manifests itself most markedly in these areas. We also studied changes over which we have little control, that may have a significant impact on the society, economy and/or environment of Hungary in the future due to the changes that are expected to occur. Such changes include the phenomenon of globalization that we will need mostly to adapt ourselves to. In the selected areas, experts, including futures researchers and representatives of other disciplines, created futures studies in which they made forecasts about expected changes as well as positive and negative development trends until 2025. The studies focused on exploring the options and limits of social and technical/technological renewal, and on discussing the related hopes and dangers/traps (fears).

Forecasts made by experts between 2007 and 2010 established that demographic processes were critical in Hungary, and the situation of families did not improve. These studies were dominated by fears: birth rate was decreasing (the overall fertility rate would stabilize somewhere between 1.2 and 1.3), the population, the number of families, and the average family size would diminish, and partnerships would be pluralized. However, there is still hope that the acceptance of traditional values and the desire for a big family and having multiple children will increase in the young generation, and this may allay fears. Another reason for fears arises from the forecast that the population's interest in sports and healthy

living will diminish, wellness will be marginalized in societal thinking, and the ratio of overweight children who exercise too little will increase by about 25%. However, the fact that the health awareness of the society and the popularity of recreational sports activities are on the rise, and new community platforms are being created that have potential for community building.

Members of the Committee on Futures Research[2] of Section IX of the Hungarian Academy of Sciences consider the deepening and growing digital gap as the greatest problem: a significant difference has developed between the various layers of the society that is further augmented depending on age, education, and geographical location. The hopelessness of those who are lagging behind carries the risk of an emerging social conflict. It inspires hope, however, that if the danger of a split in the society is recognized and widely known, then experience of the past and recognition of new situations can contribute to restoring social harmony.

In bio and gene technology the dangers of using these technologies are becoming evident as the first negative consequences are encountered. Research projects that are incomprehensible for laymen fan the fears of the population, which are also stoked by the media. It brings hope that biotechnology can increase the efficiency of agriculture, leading to considerable economic gains. Widespread application of gene technology improves productivity, ripening is faster, production is simpler, losses are reduced, and agriculture may become more sustainable.

In regard to sustainable households, the experts fear that consumers may become trapped by hypermarkets and entertainment centres while consumerism is spreading without control. The environmental load of nutrition (from shopping to the production of waste) is increasing, but in the sustainable households of the future new consumer habits (e.g. selective collection of waste) are being amplified, and the sustainability oriented mindset and way of life will appear in our everyday lives (e.g. economic use of power). All this is facilitated by the spreading of eco and bio trends.

According to the principle of *participativity*, we mapped the individual's options for social renewal: we used a questionnaire to examine the thoughts of the youth – the determinant generation that will assume decision making positions in and around 2025 – about the future. We were interested in learning how millennials whose lives are dominated by the experience of globalization, digitalization, and virtual reality, see their relationship to the future. To get this information, we explored what our secondary school, university, and college students think about the next 15 to 20 years, based on a sample of 1000 high school and 500 university and college students. What are their expectations, hopes, and fears in the various areas of their lives, what do the future employees and citizens expect, and how do they imagine their personal lives, what kind of a family do they expect to have, how many children are they planning, what will they do to make their hopes come true and to mitigate their fears. We were able to form various groups: the group of individuals in the network of the community, the individualists, the worriers and the lost, and those who are aimless. These groups had different attitudes concerning the future.

The principle of *alternativity* dictates that different versions of our future will come true depending on which layer of the society will absorb the experts' fears and hopes. If the

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"individual in the network of the community" scenario meets the experts' hopes, a positive future may be formed. However, if the scenario of the lost and the worriers is combined with the fears of the experts, not much progress can be expected.

We used expert forecasts mostly to explore future possibilities, and laymen's opinion mostly to discover what expectations of the future the residents who will be in a decision making position have. *We avoided the trap of explaining future exclusively from the past or controlling it only from the domain of desires.* In the present, we looked for the future in the space generated by this two-pronged approach, taking into account the future ideas and desires that may alter the scope of possibilities – however, the scope of possibilities can be extended on the basis of expectations. Thus, using this two-pronged approach, we produced scientifically established futures that represent the balance of the past, the present, and the future, based on which the explored alternatives were *elevated to real future alternatives. In this way, we managed to reduce greatly the uncertainty resulting from the trap of getting stuck in the past and attempting to escape into the future.*

The use of chaos theory and chaos calculations in the prediction

The first time we attempted to use chaos theory and chaos calculations to further our forecasts at the beginning and in the middle of the 1990s (Nováky, 1993; Nováky et al., 1997) when we used these methodologies to demonstrate the behaviour of Hungarian macro processes and the options to forecast them. Redoing these studies after the millennium allowed us to compare the results from the two eras (Nováky–Orosz, 2015).

Our initial assumption in the study was that at the time of the change of the political system unstable phenomena shaped our society and our economy, the forecasting of which is not possible with classic futures research methods. A new approach had to be found that can handle uncertainty resulting from instability. We regarded chaos theory as a suitable theoretical basis, and chaos calculations as a suitable method to explore if the key Hungarian macro indicators exhibit a behaviour that is typical of instability, and if so, what future can be forecasted for our country.

Our studies show that the Hungarian economy was not in a state of chaos in the 1990s, but we did find some macro indicators of the society and the economy that were characterized by strongly, moderately or weakly chaotic behaviour. These were mainly societal indicators. For example, these indicators included the number of persons who died from cardiovascular diseases, the number of registered alcoholics, criminal acts, hospital beds, and doctors. In the area of economy, the number of homes built, the gross national product, the economically active population, and the investment volume index showed chaotic properties. Tendency to behave chaotically was not typical of the majority of the studied 39 macro indicators, and for this reason, as we established, the renewal of the society and the economy is only possible with great efforts. Based on calculations we also concluded that more than one way is open to the Hungarian economy and society, and there was a chance of progress but also of stagnation and decline.

Calculations performed again in 2010 showed that our society is not in the state of mathematical chaos, and certain indicators started to stabilize and become constant. We are slowly moving away from the possibility of making a change, which means that it will be

increasingly difficult to set certain processes on a more favourable course. Future changes are expected in the services sectors of the economy, the number of homes built, the students attending secondary education, the patients died from cardiovascular diseases, and the number of commercial accommodation establishments. The key to the future, therefore, should be sought in education and in the state of the population's health. The renewing, creative power of chaos is required for the Hungarian society and economy to undergo qualitative changes and rise to a higher level, opening the way to a harmonic civil society.

Examination of unstable states contributed to the mitigation of uncertainty by *seeking an extensive range of future alternatives according to the nature of phenomena without excluding low-probability events*, through the use of the correct methodology, employing the tools of the applied method – chaos calculations.

Weak signals in practice

In the following, we will describe weak signals that can be observed in the different areas of society and economy, that are expected to become determinant, or at least accepted characteristics.

1. Big data
Big data will outgrow the world of IT and reshape commerce, healthcare, the public sector and the industry (Manyika et al., 2011), but it will also affect all the other industries. It can lead to the creation of hundreds of thousands of jobs in the future, and sets profoundly different requirements for future leaders and managers in regard to the interpretation and use of data provided by the data sources. It may also open up a niche market for companies providing big data related services.

2. Use of alternative power sources
There are several research projects focusing on the use of alternative energy sources that may lead to renewable energy sources assuming a key role in the future. For example, these research projects aim to transmit solar energy from space to the surface of the earth, or use osmosis based power plants to utilize energy produced by the contact of salt water and sweet water, and they have also been successful in producing fuel using coli bacteria.

3. 3D printing
3D printing appeared in the 1980s. The potential of the process that was in limited use then and rather expensive was unknown to most people at the time. Thanks to its favourable properties, this technology is becoming more and more popular today. It will revolutionize a lot of areas by offering the capability of producing a lot of inexpensive high quality products quickly. Examples include healthcare where promising results were achieved in organ transplantations and with protheses, but this technology was also used to create a house, and NASA is even testing 3D printing in space. Automotive industry, construction, dentistry, jewels, food industry: these are just a few examples of the versatility of this solution (Harrop-Gordon, 2015).

4. Teleportation
The National Institute of Standards and Technology (NIST) achieved considerable successes in teleportation. Quantum information was successfully transmitted to a distance of 100 kilometres. This beat the previous teleportation record (2014) of 25 kilometres (Takesue, 2015). Quantum communication technology is far from commercial application, but it has tremendous potential.

5. Smart devices, data storage
Extension of the areas of application of smart devices and their increasing popularity among consumers are expected in the nearest future. New research aiming to enable DNA data storage will give this technology momentum. This solution that was developed by Microsoft and the University of Washington is extremely dense and durable.

6. Popularity of self-driving cars
Adoption of self-driving cars may lead to faster, smoother and, above all, safer road traffic. Due to shorter commuting times and a decrease in the number of traffic accidents, it would provide significant financial and social benefits. The technology for the manufacturing of self-driving vehicles is already available today – the most recognized self-driving cars are made by Google and Tesla, but there are still a lot of outstanding issues in terms of regulations. Despite these problems, the first models that offer an almost complete set of driving *assistance* functions have already appeared, but for now these functions only work if the presence of the driver is detected. Examples include the ProPILOT technology of Nissan and the products of premium manufacturers.

7. Use of robots in all walks of life
As early as 2005, a robot was planned to be marketed in Japan as a chat partner for elderly people. Robotics has improved a lot since those days, and Erica, a robot from the University of Osaka, can send non-verbal signals in addition to verbal communication, and bears an uncanny resemblance to a real person. In the future, as manufacturing becomes cheaper, the use of robots may be widely adopted. In Japan, there are a lot of real-life examples of their use, including a robot called Otonaroid that was introduced as a museum guide, while NAO operating as a bank information kiosk can communicate in 19 languages with the clients. But there is also a robot that was developed to assist in studying languages or to accelerate recovery from illness (Paro, a therapeutic robot). There is already a hotel where robots receive the guests, and in a few years the first farm run exclusively by robots will start to operate.

8. Alternative educational solutions
Due to easy access to materials, the significance of lexical knowledge has declined. Further spreading of alternative educational solutions and their increased recognition are expected due to their flexibility and the cost advantage they offer. New technologies support experience based education. The holographic smart glasses called MetaPro, which can be used, among other things, to visualize our bones, making it easier to learn about them using graphical imagery is a good example of such use.

9. Medical technologies
The development of medical technologies improves the conditions and chances of healing. A bionic eye provides people who would otherwise be unable to restore their vision with the ability to see, and printed organs give people who waited for transplantation in vein a chance. It will be possible to alter the structure of the DNA. CRISPR-Cas9 allows researchers to perform the targeted editing of the DNA accurately and in a way that is more flexible than ever before. Big data improves efficiency and reduces costs in many areas of application. For example, its use improves the productivity of research and development, and allows for the design of decision support system that rely on thousands of data entries (Manyika et al., 2012). Costs can be reduced by the introduction of diagnostic applications that will use mobile phones to perform simple examinations (blood sugar, blood pressure measurement) (Topol, 2015). In addition, dietetic applications and home pages (e.g. WebMD) provide assistance in resolving certain situations without medical intervention.

10. Artificial food
Both the shrinking potable water supplies and the increasing population drive the future towards the production of artificial food. Artificial meat produced with an otherwise simple technology is expected to have a profound impact on agriculture and foodstuff industry in the future (Post, 2012). 3D printing is also in the limelight: NASA is currently planning on providing food for astronauts with this technology, but the success of the project will sooner or later followed by its widespread adoption. Robotics in agriculture opens up new horizons – the previously mentioned automated farm is a good example.

11. Space travel
Researchers are working on designing rocket engines that use much less energy, weigh the quarter of the engines that have been used to date, and can operate without fuel. If further testing is successful, it can turn space travel upside down, and maybe even make it accessible for ordinary people. The discovery of gravitational waves opened new perspectives in astronomy. This research is particularly noteworthy because more than 1000 researchers from 15 countries collaborated as part of the international LIGO Scientific Collaboration project. As a side effect, the project may also offer never before seen opportunities in scientific cooperation.

12. Cyber attacks
Most certainly security policies and future wars will be dominated by bioweapons and cyber-attacks. Even now we can read about the development of viral weapons with high fatality rates. Cyberattacks disrupt energy supply as it happened in Ukraine in December 2015, but they may also target financial services and any major players of the economy.

Future changes in the environment may also have serious detrimental effects that will affect the security of all countries, and have an impact on the security forces of the future. For example, global warming may affect water management, pose energy security risks, cause floods, mass migration, and medical disasters, and lead to loss of productivity in agriculture (Kovács, 2008). Advanced technologies also find their way into the world of law enforcement as they become part of the everyday criminal activity. For example, face recognition systems are becoming ubiquitous, just like the various methods of predictive analytics thanks to the emergence of big data.

Examples of wild cards

Although in literature the two phenomena tend to be used interchangeably, it is reasonable to make a distinction between wild cards and gradual changes. The difference is demonstrated with a spot-on example by Hiltunen (2006: 67.). The example makes a distinction between the two types of changes at the individual's level, but the difference is equally applicable at global level to real-life wild cards. If a person is diagnosed with a terminal disease such as cancer, the family members will still have some time to prepare for the inevitable. This change can be characterized as a gradual change. However, if the family member dies suddenly in a traffic accident, there is no time to prepare for the loss. In both cases, the outcome is the same, but in the latter case the occurrence of the event is entirely unexpected, which means that a wild card is generated. Even if a wild card is encountered, there may be weak signals that foreshadow the occurrence of the event. According to the presented example, such a signal could be the driving style or the lifestyle of the person.

Below we will list a few examples of wild cards according to STEEP. Consequently, we will handle the *social*, *technological*, *economic*, *environmental*, and *political* fields separately, even though the complexity of the effects often complicates classification.

In society

A scientific discovery may significantly prolong life expectancy at birth. If it comes with an increase of the years lived in good health, this wild card will also have an economic effect due to, for example, the reduction of healthcare expenditures or the rise of the ratio of economically active population.

An increase in the frequency of terrorist attacks can be forecast with a high degree of certainty. The attacks themselves are unpredictable and difficult to prevent. Their nature is also changing, they cause more and more societal and financial losses, and they are becoming global. As a result, people feel less secure and xenophobia is on the rise in the affected countries. The spreading of new types of attacks such as cyber-attacks that target politi-

cians, the media, but also the ordinary citizens should also be considered. The information technology network of the Hungarian government and the Swedish news portals faced such an attack in 2016, or the Ukrainian population in 2015 (in the latter case, the energy supply was targeted). Deployment of biological weapons can also be a wild card in the future. Beyond influencing the direction of development efforts aimed at improving security, the new types of threats have an impact on other areas, including the voluntary restriction of human rights in an effort to protect them.

A nuclear war is becoming a real threat. The experts of the *Bulletin of the Atomic Scientists* set the doomsday clock in 2016 to 3 minutes to midnight (the number of minutes to midnight represents the degree of threat, which was 17 minutes back in 1991) (Mecklin, 2016). According to the experts, the struggle against climate change also increases the threat as commitments to reducing the emission of greenhouse gases cannot be met without resorting to atomic energy.

Epidemics may break out and cause global problems. Tourism and international trade may contribute to the rapid propagation of dangerous viruses on several continents, and beyond their obvious medical implications, they can also affect the level of international tourism, the selection of travel destinations, and the people's overall perception of safety. Also, the effects may last longer than the viral threat itself.

In technology

In technology, research produced several results that may lead to significant changes in social life. Unexpectedness may be present in how quickly the results produce an impact and in the nature of the results: the latter may also be greatly influenced by chance. There may be a fundamental change in the sources of new scientific discoveries and technological developments. New players may enter the scene, and new types of joint cross-border research projects may be organized.

Implementing the technology of energy transfer from space is a possible wild card, which would represent a huge step towards a cleaner source of power. It is conceivable that the energy revolution will take place here on earth when a new, cheap, clean, oil-free technology emerges that can reduce the randomness and the environmental load of the current solutions (we just need to consider the unpredictable fluctuation of the wind power output and the considerable environmental load of technology). A futuristic element of wild cards in technology, which is quite interesting for many people is the question of what role artificial intelligence will play in the future. Some of the scientists believe there is a real chance that AI will take control of the human race, which may also lead to the extinction of humanity.

In the economy

A typical wild card in economy is the onset of a financial crisis. It is typically global due to the high degree of interdependence between the countries (we just need to recall the crisis unfolding in 2007). Beyond the decline of economic performance, it produces several social

problems, but may also have positive effects through the reformation of markets and financial products and the rethinking of the applied models.

The bursting of stock exchange bubbles resulting from the overvaluation of securities or a change in the political situation may lead to the collapse of stock exchanges. Artificial manipulation of the market may also trigger such processes. Due to interdependencies, the effects usually spread beyond a single stock exchange. In 2010 it was believed that an attempt to manipulate the market led to investors trading in American, European and Asian security markets losing 1,000 billion dollars within a few minutes, but the foreign currency and raw material markets were also hit.

In the environment

Several wild cards may emerge that can lead to a natural disaster. Natural threats include floods, groundwater, earthquakes, drought, extremely hot or cold weather, and volcanic eruptions. Most of these wild cards are localized, and affect the population and the economy of a given country. Beyond their immediate effects, they can also amplify demand for the development of early warning systems and for coordinated efforts, they influence the direction of technological development, and in this way they play an important role in the process of learning and in avoiding similar wild cards in the future. The introduction of stringent new environmental regulations can also be considered a wild card. If new environmental regulations are adopted, it transforms the industries involved. For example, CO_2 emission reduction initiatives adopted in Paris in 2015 in connection with climate policies have a significant impact on the energy sector, and represent tremendous business opportunities for certain stakeholder groups.

One group of wild cards deals with the probabilities of events in the universe, and handles profound changes in our knowledge of the universe. Such an event could be the discovery of evidence of extra-terrestrial life or a planet that supports human life. A collision with an asteroid deflected accidentally towards the Earth (the number of such asteroids in the Solar system exceeds 1 million) or with a planetoid would be an extreme example of a wild card.

In politics

Wild cards may also appear in politics. An example could be the victory of extremists at the elections or the outbreak of a civil war. Politics is a special field because it has a strong influence on wild cards appearing in *other* areas. The problem is caused by the fact that the ordinary citizens have a significant influence on public policies while they do not possess the knowledge required for contemplating certain issues and making decisions about them. Relaying the experiences of one of the advisers who worked for George Bush, Posner (2007) mentions, as an example, that the threat posed by asteroids was effectively ignored. According to the advisor, sufficient funds were not allocated to this research because the average American was not worried at all about such a potential catastrophe (even though the number of asteroids makes it a real threat). Another issue is the time horizon. For example,

the probability of a biological attack is very high in a 10-year period, but it is very low in the next 6 months. The same is true for other wild cards. And the politicians are known to be reluctant to make costly decisions without clearly outlined results.

An argument that supports political decisions is that preventive measures or a response to wild cards may benefit several areas at the same time. For example, measures intended to prevent a biological terror attack can be useful in handling an epidemic that broke out due to natural causes. Also, measures aiming to reduce demand for crude oil may not only play an important role in the fight against global warming, but they can also reduce the probability of depleting the fossil energy sources and mitigate energy dependency (Posner, 2007). The number of wild cards will probably grow in the future. As the examples demonstrate, these cards may appear in several areas, and they can be often quite specific (e.g. environmental issues), but their effects and subsequently the handling of the issues in order to avoid similar wild cards in the future may be a complex problem. For example, cooperation against natural disasters has political, economic and technological aspects.

It is important to note that even though the emergence of a wild card is often linked to a specific geographic location or settlement, but the produced effect and the subsequent process of learning may be global. For example, the outbreak of an epidemic may encourage other countries to develop vaccines and introduce other preventive measures. In addition to their spatial character, wild cards also differ in their temporal nature. Certain incidents have a lasting effect that linger for a very long time after their occurrence (for example, a disaster at a nuclear power plant) – in other cases the time window may be a few years or even less. A particularly dangerous situation may develop if wild cards of different types produce a combined effect.

Summary: reducing uncertainty and striving for security

Our studies based on theoretical and practical approaches show that uncertainty of the future can be reduced by applying the methods of futures research, and in this way security may also be improved by carefully adapting the aspects of the theoretical/methodological issues of futures studies – dual uncertainty, determination, chance, unexpectedness, information, stability, instability – to specific tasks, clarifying the applicable futures research methodologies and principles accordingly, employing the correct methods, and exploring weak signals and wild cards with an emphasis on the search for all things new will bring us closer to mitigating uncertainties that still exist in regard to the future. As it stands, these efforts facilitate exploring the capacity for renewal represented by these processes, tendencies and the events that change them, and the correlations that often form circular processes.

Futures studies draws the attention to the fact that on the one hand we need to adapt to the given conditions, and on the other hand we need to strive to change them, which means that the approach and methodology of futures studies rely on *the understanding of objective conditions and the recognition of the necessity of subjective changes*. Futures studies encompasses the recognition of economic and natural conditions as well as the efforts to exert a positive influence on the population's views of the future. This task can be achieved by reinforcing the future-oriented attitude of the youth and their readiness to act (Nováky, 2006), improving tolerance towards nature and each other, and by acting together

and cooperating with each other. This is the goal we intended to further with the subjects discussed and the examples – *best practices* – presented in this study.

As shown, uncertainty, lack of structure, and instability have benefits we can exploit so we should not try to avoid them but rather we should leverage the advantages they offer. We need to learn – and we need to teach it to the young generation – that *uncertainty is often a pre-requisite of achieving a new state that is preferable to the previous one*, but we need to manage our available assets carefully, and apply a strategic approach to determining the future changes in our course of action. *Security may only be achieved by travelling on the bumpy road of uncertainty to the end in order to understand its causes, employing a future-oriented approach with determination, and shaping our future carefully with positive acts.*

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Exponentially accelerating time – growing security risk Outlook on the security challenges of the 21st century based on World Models

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Abstract

The basic idea of the research: accelerating time has created such negative phenomena that will have a significant effect on security policy in the coming decades. (Including, for example, population explosion, the increasingly stronger and wider economic and social crisis, the deepening economic inequality, the acceleration of economic, social and scientific development, the disintegration of human communities.)

The Club of Rome, playing the role of instigator in the investigation of world processes, and the World Models prepared by the Club already half a century ago indicated the most important problems of today and future. These problems are closely related to security and foster a feeling of insecurity of people's sense. The desirable harmony among nature, economy and society has disintegrated, and the economy and profit play a decisive role. The problems of the future of the mankind arise from this fact. The security policy of the 21st century must take into account these negative phenomena and develop an appropriate strategy.

Keywords: security challenges, uncertainty, World Models, Club of Rome, Future research, social and economic crisis, globalization, accelerating time, population explosion, scientific and technical progress

The age of uncertainty

The notion of security sums up in the broadest sense all those social, economic, and natural phenomena, processes, and problems that are determinant factors of the people's micro and macro environment in a given period. Using a simplistic approach, this process began in the paradise, in the original "two-person society" where the first pair of humans lived in perfect and complete safety, but after taking the apple and being expelled from paradise, they found themselves in the world of uncertainty, and as hundreds, thousands, and millions

of years passed, this uncertainty kept growing and the desire for safety became a dream that is getting more and more unattainable.

From a scientific point of view, we can say that one million years ago there was no man on the Earth, but half of million years ago, our ancestors already appeared, and in the wilderness of Vértes, Samuel, the pre-historic man, together with tens of thousands of other pre-historic humans already banded together and roamed the picturesque lands of the Earth in hordes. In the following centuries and millennia, progress was barely noticeable, but later it gained momentum and instilled an increasing sense of uncertainty into an ever growing number of people, bringing about its objective factors.

The notion of *accelerating time* is a collective bag for all those positive and negative factors that our Mother Earth has to shoulder as an increasing burden: it is doubtful how long she will be able to bear it. The dramatic increase of the human population, the worrisome depletion of the natural resources of the Earth, the widening gap of inequalities are all contributing factors of the security problems in the 21st century and the threats that arise in this context. Also, challenges to security policies in the 21st century arise from the search for the causes of uncertainty, the investigation and exploration of what historical processes led to the current situation, how the phenomenon of uncertainty appeared in various historical eras, how a situation that is markedly different, more critical and dangerous than ever, and more difficult to tackle could have developed by the beginning of the 21st century.

Compared to the previous ones, this present crisis is special, complex, and global. It spans the entire economy and society (social and economic crisis), and affects almost every developed country on the planet. We need to emphasize, however, that crises are not the products of our era – they also occurred in the past history of humanity. Elemér Hankiss discusses this topic in detail in *Magyar Tudomány* (Hankiss, 2013), which serves as a suitable basis for a brief overview. (We must stress that a crisis is particularly important in terms of security, because during a crisis uncertainty increases, a previous stable set of conditions that were thought to be certain cease to exit, and financial and moral anchoring points that represented safety for the people are lost.) An *ontological crisis* essentially means the crisis of human existence – it is its original state in which the eternal and inherent state of the human being manifests itself.

Degeneration theories interpret the history of humanity as a constant process of decline that leads from a former "golden age" to an "iron age" that represents the final state. In the modern era, especially in the 20th century, these theories gained special emphasis and significance. Scientific progress and results achieved in healthcare, and the advancements in science are recognized, but special emphasis is given to collateral (or resulting) detrimental, dangerous and destructive effects. (It is described quite aptly in a report entitled *Microelectronics and Society – For Better or for Worse* of the Club of Rome in which they examine the eternal problem that every scientific achievement has its dangers, especially if it is in the wrong hands. One of the most startling result of the biological revolution of our days, the ability to clone a living organism is maybe the most striking example of this danger. Dolly, the cloned sheep, became world famous. There is no doubt, in terms of the wholesome development of the human race, extending this technology to humans would entail unpredictable risks.) The sense of decline is particularly strong in the developed countries, which contrasts with the healthy dynamism of the developing countries and their efforts to progress.

In the *historians'* interpretation, human civilization moves in a circle, and a peculiar *civilization lifecycle*, not unlike the life cycle of the fauna or of certain technical phenomena and consumer goods, can be observed. Once a civilization is established, an (exponentially) accelerating development begins, which later transforms into a parabolic curve that reaches a maximum point after the rate of growth gradually slows down, followed by a period of decline and extinction. In this way, civilizations either go extinct or they are transformed (or merged) into a new civilization. There is a prevailing view based on this approach that the developed countries (the rich North) have already passed the apex of their development, and now a process of decline has started. In terms of our research objective, it is an interesting view because security risks are particularly increased for a declining security (or continent), and pessimism and the lack of faith in the future amplify the sense of danger and the probability that the objective factors of security risks will emerge. Even this fact in itself represents a security risk!

Scientists and researchers subscribing to the notion of *axial (pivotal) age* do not expect the development of mankind to follow a course of constant progress or decline; rather, they place emphasis on the *great breakpoints* of the history of humanity. That is how Karl Jaspers (Hankiss, 2013) describes the period between 800 BC and 200 BC, which was characterized by a great transformation and a struggle between ancient civilizations that were either based on contemporary magical world views or on monotheism, with an emphasis on the central role of rationality and men. There are many scientists who believe that the profound social, cultural, and mental transition between the conventional Western civilization and the modern age that began with the renaissance was a similar axial age. (Many of them call that period "*second axial age*".) Due to the accelerated progress, the past 40 to 50 years saw processes that brought about qualitative changes – the transition of the modern age into the postmodern era can be *regarded as* a *third axial age*.

Social and economic changes in the era commencing from the middle of the 20th century also indicate that we are witnesses or suffering victims of a qualitative leap or a revolutionary change. A new world is being born, but the old one is still present, and "floating" between the two evokes a sense of uncertainty in the people: thus, we are fully justified in calling this age the "*age of uncertainty*". In the 1990s, the sense of uncertainty became stronger in the economic, social, and ontological sphere: researchers and experts of this age are writing about societies at risk, societies, dominated by uncertainty and surprise, that are becoming chaotic, the crisis of global capitalism, and the global jungle. A lot of researchers and philosophers contemplate the spiritual crisis of the 20th century as a typical phenomenon of a historical transition and qualitative leap, they ponder about the crisis of human existence, and regard the century as an era of shattered faiths and withered traditions, describe it as a living dead modern materialist civilization, and they talk about the eclipse and crisis of reason, the fairy-tale of happiness, and the one-dimensional man.

The people's sense of uncertainty is amplified by the fact that new and old *behaviour patterns* often change their meaning too. New views, new categories appear that are strange for the men of yesterday, and truths and moral standards once thought eternal either change or perish. For example:

- "waste not, want not" was replaced by "consume as much as you can",
- the moral command "be modest" is replaced by the expectation "be successful",

- instead of supporting your fellows, in the spirit of competition you need to defeat them,
- the commandment "Thou shalt love thy neighbour" is overruled by the principle "love yourself",
- instead of obedience, you are expected to get rid of obligations and secure your freedom.

All these considerations are extremely important in terms of our research objective – the interpretation, analysis, and prediction of security – because it is the lonely human who, by projecting his or her internal uncertainty, becomes a precursor of a detrimental situation or process as this projection determines the boundaries within which the objective phenomena of the outside world is interpreted (which means that the importance of even the most harmless minor external uncertainty events will be overinflated, and singular events will lead to far-fetched generalization).

The *dissolution of the sphere of symbolism that surrounds human communities* has similar specific consequences in practice, which represent defencelessness, hopelessness, and uncertainty for the person in question. During the course of history, humans not only surrounded themselves with physical barriers, they were protected not only by forts, city walls, weapons, armies, and organized institutions, but also by a certain kind of spiritual bubble we can commonly call civilization (religion, myths, legends, science, arts, etc.). *All these factors – the physical and the civilization bubble – together provide mankind with a sense of tranquillity and safety and faith in the future, which give the assurance of a predictable and quite life.*

The circumstances, however, are prone to change over time: they change, they are transformed, or new circumstances arise. Changes in the physical conditions are easier to follow and are not so "damaging" to the personality than a change in the civilization that would render people uncertain and vulnerable, causing them to lose their grip, their faith in the future, and the meaning of their lives, and making them lonely. The quicker the changes are, the less time it takes for the changes in civilization to affect the people, the stronger this effect will be. The fact that accelerating time sweeps away everything old and builds up new and unknown phenomena should be emphasized again in this context, and it supports our initial hypothesis that exponential changes are the root cause of the many problems of this age, including, in particular, uncertainty.

The millennium is seen as a period of revolutionary changes, and this description obviously applies to the human communities, the society and the economy too. We are witnessing new phenomena of which we did not have any idea at all. One of these new phenomena is *globalization*. In the past, which means 50 to 60 years ago, the social net was represented by – living and transparent – communities like family, friends, and place of work, the boundaries of which were pushed to the country's borders: moving beyond that was considered an extraordinary experience (on the occasion of a tourist trip or studying abroad for any length of time). *The transparent, closed and protective small communities provided a sense of tranquillity and safety, the rules of coexistence that were adopted minimized the emergence of abnormal phenomena within a settlement or a community, and the sense of security was inherent under these circumstances.*

The world that was opened up by the change of the political system expelled people from the well-known and secure communities, the air became thin and the community-oriented men ran out of oxygen. The new spirit of globality and its moral and behavioural patterns are almost incomprehensible for people today. Old truths have lost their values, and new questions that have no answers yet arise. Strangely, the modern world, the cold rationality plays a role in augmenting the sense of uncertainty. *With their legends, myths, and magical worlds, civilizations in the past ages encased humans in a soft and warm protective bubble inside which they felt safe and secure.*

Strangely, *scientific revolution* has the same peculiar effect on the people's sense of security. The world that made the old civilizations colourful and warm, the sky that hid wonderful secrets, the stars and the universe are becoming more and more rationally intelligible and lose their secrets, thanks to the scientific advances; the enigma, the appeal of the mystery vanishes, and phenomena that used to carry a mystical substance become empty and meaningless. The list of processes, resulting from scientific advances and progress, that have a special and surprising effect on people's lives and personalities and their loss of certainty would be a long one, however, what we have already said is sufficient to prove in a convincing manner that the uncertainty of our age is not just an economic, political, and social phenomenon, but rather it is also a civilization crisis of the developed countries and a crisis of human existence. If millions of people lose their faith, if the past loses its value to them, if they have no hopes for their future, then a sea of uncertainty may arise with a significant impact on our sense of security, creating a false and unrealistic view of the objective processes that are experienced in these areas.

Among the revolutionary changes of the millennium, we absolutely have to mention the global changes that affect profoundly the people's sense of safety/security/uncertainty, and the transformation of the macro environment that used to convey a sense of stability, relaxation, and safety. Elemér Hankiss (2013) sorted the views about a few important areas of our lives at the end of the 20th century and at the beginning of the 21st century into the following pairs:

- Is there a world chaos instead of a world order?
- Are we witnessing the foundation of new empires instead of an American empire?
- Do we get Bellum Americanum instead of Pax Americana?
- Global instability instead of global stability?
- Decline of the West instead of dominance of the West, and the establishment of a multi-centered world?
- Global conflicts instead of global peace?
- Spread of terrorism instead of security?
- Economic crisis instead of economic growth?
- Unsustainable development instead of unlimited development?
- Seven years of famine instead of the age of affluence?
- Developed countries fencing themselves in instead of a free world?
- Functional disorders of democracy instead of its triumph?
- Emergence of neo-nationalism instead of internationality?
- Fundamentalism gaining momentum instead of tolerance?
- A world of injustice instead of a more equitable one?
- Rise or decline of solidarity instead of an uncaring world?
- Rebellion of the poor instead of silence of the poor?

The above set of problems are only a part of the phenomena representing and amplifying uncertainty that people in the 21st century are facing, and that cannot be answered in the old way. Getting lost in the jungle of the new world is understandable and so is the fact that millions of people come to desperate straits, lose their sense of security, and become vulnerable.

In the light of the the above, it can be said that the 21st century is probably the most complicated age of human history producing fundamental changes, and this obviously has a negative effect on the micro and macro factors of security as well as on the of the people's increasing sense of uncertainty. The driving force behind this phenomenon is the exponentially accelerating time the characteristics of which we will review in the next chapter.

Accelerating time

Based on the objective and spirit of our research, we will examine the phenomenon of accelerating time from the point of view of security. We are looking for an answer to the question of what effect the accelerating rate of progress in this age produces at the different levels of security and how it affects the people's quality of life.

Our initial hypothesis is that, just like the physical interpretation of speed, accelerated transition in the society, economy and politics increases uncertainty, tension, anxiety, and the sense of danger. For example, the driver and the passengers in a car travelling at 80 to 100 kilometres per hour on the highway can have a relaxed conversation, it is easy to monitor the traffic, there is enough time to avoid dangers that may abruptly arise, and the car can be stopped in a short distance if necessary. At a speed of 150 to 160 kilometres per hour, however, the situation of the driver and the passengers becomes more complicated, intense concentration is required, and sharp turns and frequent overtakes pose a potential danger. The driver will grow tired and anxious in a short time, which is an additional source of danger.

To the above two sketchy examples, we absolutely need to *add two more factors* the social and economic analogy of which is quite easy to recognize.

- *First:* traffic conditions, road quality, weather, and intensity of traffic are key considerations. In clear weather on a multi-lane highway under favourable traffic conditions with a visibility range of several hundreds of metres even travelling at a speed of 130 kilometres per hour will not cause any problems, while in rainy, foggy weather with a visibility range of 30 to 50 metres, driving on a simple road at a speed of 60 to 70 kilometres per hour may be very dangerous.
- *Second:* the condition and quality of the car we are travelling in, whether or not our headlights and fog-lights are strong enough and the brakes are in order, and the condition of the tyres are not negligible factors either.

Down the road of the extremely long history of humanity spanning about ten thousand years, travel conditions were extremely varied: in the beginning the world seemed to be standing still and – with an analogy borrowed from physics – humanity's cart only "advanced" a few metres a year. In our early history, the progress of humanity is described with so-called *geological time spans*, each spanning thousands of years between the key events.

A significant change occurred when ten thousand years ago mankind began to cultivate land and grow plants, and in the river valleys a civilization of city dwellers was created. The *revolution of agriculture* was the first qualitative, revolutionary change in the history of mankind, and subsequent changes can be measured and interpreted by *historical time spans*.

Much later, about two or three hundred years ago, came the second huge revolutionary change in the progress of mankind: the *industrial revolution*. The accelerating changes affect all facets of human life, including the economy, the society and the environment, with a lot of positive and negative consequences. Just like a river, the flow of history also carries flotsam that may either help or hinder humanity's development and progress. Let us examine a few fitting examples to describe the above phenomenon

German astronomer Henry Siedeintopf compressed the major events of 170 million years of Earth's history into a single calendar year, and distributed the major milestones to proportionally shorter time frames (month, week, day, hour, minute, second). The "model year" he developed in this way is widely used for presenting the acceleration of change due to its easy-to-grasp character (Láng, 2003).

Timetable of the key events based on the above model:

- January – fauna appears on the Earth,
- March – the first species of insects appear,
- July – the first giant reptiles appear,
- September – dinosaurs go extinct,
- October – the evolution of mammals begins,
- Week 2 of November – primates appear,
- December 30 – *homo erectus* appears,
- December 31, 20:00 – Neanderthals go extinct,
- December 31, 23:30 – Mankind invents agriculture,
- December 31, 23:59:30 – Industrial revolution,
- December 31, 23:59:48 – Car and airplane are invented.

In the geological calendar year, realizing how time units shrink by leaps and bounds is as startling as recognizing the fact that a period of 10,000 years starting with the appearance of agriculture takes place in the last 30 minutes of the model year, while the industrial revolution in its last 30 seconds, and everything that we consider the achievements of the scientific revolution lasts only 12 seconds: the advances of spaceflight, information technology, and the biological revolution (and we could go on citing the achievements of the end of the 20th century and the beginning of the 21st century). In light of the above, we should not be surprised that the passengers of Spaceship Earth are observing with uncertainty and desperation this accelerated speed that is nearly unfathomable for the ordinary human mind, they lose their former sense of security, and they feel exposed and vulnerable.

Table 1, which is based on the lectures and works of the brilliant physicist György Marx (Marx, 2005) shows the acceleration of time and the exponential curve of the course of human history with a peculiar approach. With this table, we will compare three historical periods: ancient history, modern history, and late modern period in terms of time, matter, human model as well as science and arts.

Table 1
Comparison of main historical periods to illustrate the acceleration of time

Time period **Factors**	**Ancient history**	**Modern history**	**Late modern period**
Time	Changes are noticeable after several generations	Changes are noticeable in a single generation	Changes are noticeable during the lifetime of a single generation
Material	Marble, gold	Steel, coal	Electron, light
Human model	Statue	Steam engine	Computer
Science, arts	Sculpture, architecture, statics, geometry	Baroque style, sciences focusing on motion and future (dynamics, evolution)	Modern natural sciences, informatics, high-end technology

Source: Author's own compilation, based on Marx (2005)

Time was almost standing still in ancient history, the progress of humanity's historical cart was unnoticeable for the people, and awareness of the future was still in its infancy. No traces of progress or change can be observed, it takes a period spanning several generations to notice something, and ten, twenty or fifty generations have to pass before something noteworthy occurs. There is no future, only the present, and for people, especially rulers, achieving immortality is the ultimate goal.

This attitude towards life is expressed by the spiritual, artistic and scientific perception of the era. The material of this period is marble and gold that signify eternity, timelessness and wealth. The human model is the statue, which, as a world model, proclaims the immortality of the great men of the era for all eternity. Even the initial achievements of science are linked to this philosophy. Beyond sculptures expressing the immutability in this age, the development of these disciplines are driven by the need for architecture, statics, and geometry required for building huge monuments, pyramids, and palaces.

The people's security and sense of security can be regarded as stable in this age. Moral commandments set in stone, a very effective family education, the unquestionable authority of the father, the head of the family, created order and tranquillity. For thousands of years, this culture proved to be successful and productive – we call it Mediterranean culture.

In the modern age, after a leap of several thousands of years, we experience a different situation: the era of tranquillity and slow but reassuring progress is over, and we entered a new section of the great road of history, with the traffic becoming more dense, faster-paced and more dangerous. This period is the age of great discoveries and the industrial revolution – with the discovery of the New World, a process of global trade began, and thanks to the technical-scientific revolution, there was a sudden leap in the number of new products appearing, the product life cycles became shorter, technical-scientific innovation reached an unprecedented level, and the pace of change accelerated so much that it became *noticeable during the change from one generation to the next*. The materials of this age are steel and coal, which indicates the energetic growth of industrial production: giant factories were

built, mines were opened – it became evident that after the agricultural revolution, a new phenomenon, the industrial revolution ruled the scene.

The driving force behind this unprecedented dynamism was the invention of the steam engine, which created motion from burning fuel, revolutionized productivity, and made an impact on all walks of life. The steamship and the steam locomotive opened up a new dimension of transport, and steam engines used in production allowed for resolving tasks that were previously considered unfathomable using human labour. Modern history is an era of motion and dynamism. This was reflected by science and arts. Disciplines studying the future (Newton, Darwin), the baroque style, music, and arts (Shakespeare, Monteverdi) appeared. In this world full of change, the role of the family was also transformed: it was no longer able to respond to the various new demands, so schools and teachers were introduced, and the Mediterranean culture that was typical of ancient history was replaced by the Atlantic culture.

From the point of view of security, modern history created a new situation where uncertainty experienced by the people increased compared to the previous time periods, factors threatening security intensified in every segment, from the personal (subjective) level of the individual to the macro level of politics and society, and ever greater efforts had to be made to ensure the security of existing assets, personal wealth, and people.

*The late modern period, the end of the 20*th *century and the first part of the 21*st *century,* shows a previously unimaginable rate of change, marked by qualitative leaps and revolutionary changes. The *digital revolution* created a new and unforeseen situation in manufacturing, economy, and society, and in the lives of the individual people. The *biological revolution* produces newer and newer results (sometimes bordering science-fiction) of which the creation of the human genome map and the cloning of living organism are maybe the most known and most perplexing. Thanks to the exploration of space, space travel has become reality today: the space shuttle that will take anyone to space as a space tourist for 100,000 dollars is ready to launch. Construction of space stations capable of supporting human life in space and an energy platform that collects solar energy in space and beams it down to Earth, etc. are encouraging developments.

Today the accelerate pace of change is noticeable even for individuals: single men may experience the birth of new achievements multiple times during their lives, and events that used to take place during a period of centuries may occur as frequently as every 5 or 10 years. The statement of György Marx that today people experience more changes during their lives than one hundred subsequent generations in the ancient Mesopotamia is both spot-on and graphic. The materials of the era are the electron and the light, and it is not the mass that determines the value of a product, but rather its information value, the measure of how smart it is. In the world of micro and nano chips, material dimensions are almost undetectable: we can carry with us a library of information on a single board or chip.

The digital revolution is driven by the computer, which is the human model of the modern man, and the element of today's Generation Y, Z, and Alpha. In this context, the modern natural sciences, information technology and high-end technology represent the scientific spirit of the period. This age goes beyond the Atlantic culture, and the role of family and school is completely redefined: many experts call it the *Pacific culture*.

An integral part of the above large-scale overview is a similar description of social and economic formations: the two methods creates a complete introduction to the complex acceleration of the human history.

Table 2

Economic and political centres of the key historical periods

Period	Economic and political centres	Social base	Preferred capital investment
Middle ages	agricultural estate	agriculture based society	investment into agriculture
Modern history	industrial centres	industry based society	industrial investment
Late modern history	knowledge centre	knowledge based society	knowledge oriented investment

Source: The author's own contribution

In *the middle ages* the centre of economy and politics was *the agricultural estate*, and, as a result, the majority of the population (80 to 90%) worked in agricultural production: we can describe the society as *agricultural society*, and naturally the preferred form of investment was agricultural investment. This age belongs to the development stage of humanity where the rate of progress was still rather subdued (in reference to our discussion relating to the above table: changes took several generations to become noticeable), and consequently the time factor, the sense of uncertainty resulting from the acceleration of time did not have a significant impact on the people's sense of security. Of course, there were other factors: the extremely poor conditions of living, physical labour that shortened the people's lives, and the low standards of science, culture and medicine. In summary: ensuring the minimum conditions of physical existence greatly contributed to the sense of uncertainty (and exposure) felt by the men of that era. Although low-key in their scope, magnitude, and effects, security risks appearing at macro and political level were present and they contributed to the uncertainty of people attributable to such sources.

For people at the lower tiers of the feudal pyramid, the authoritarian and totalitarian system that was a product of the feudal society meant dependency and helplessness, a certain kind of dictatorial order that was backed by the merciless power's almost limitless room to manoeuvre. This situation was special in terms of the safety of people, their families and property, because, on the one hand, they were completely in the power of their feudal overlords (e.g. the right of first night, taxes, corvée, etc.), on the other hand, however, acts that are today subject to criminal laws were greatly reduced. (This phenomenon is not only typical of the feudal period hundreds of years ago, but it is still present today in all those countries that are governed by a central power in the form of a dictatorship. For example, such a country was Hungary before the change of the political system where, as a by-product of the rule by fear, lovers took a stroll in peace on Margaret Island or on Gellért Hill, and a young girl could go home at night without being afraid of any atrocity. It is a peculiar situation that clearly exemplifies the colourful nature of our world and the difficulty of making a judgment.)

The new time period that came after the feudal society was the *age of industrial revolution*, an early precursor of an accelerating world. The invention of the steam engine, the creation of factories, the opening of coal and ore mines, the acceleration of transport thanks to steamships and steam locomotives, and the start of industrial production entailed increasing demand for labour, and the migration of workforce from agriculture to industry began, and soon about 50 to 60% of the population worked in the industry. It was the beginning of the *industrial society*, which is incomparably more heterogeneous, dynamic, and powerful than the previous agrarian society. This age affected the people's sense of safety and security more deeply, earning one's livelihood became harder, the uncertainty of employment and existence became increasingly prevalent, and due to the nature of capitalist production, a number of former moral boundaries were demolished, respect for other people's property and life was weakened, and so was the power of moral, ethical and religious commandments. Gangsterism was spreading, underworld powers acquired several economic and political positions, cigarette, alcohol, and later, drug smuggling grew into a huge industry.

Wars and skirmishes of the feudal age also spread both vertically and horizontally in the modern industrial age, and became larger, and due to advances in technology and science that gained momentum as a result of the industrial revolution, "advanced" weaponry that became more devastating and dangerous, and threated masses of people was created. Swords and rifles were replaced by machine guns, long-range artillery, tanks, and later, by bombs and aircraft. World War I can be regarded as a scarily representative example of this process. Due to the nature of industrial capital and its unstoppable drive for profit, the threat of aggression and military conflicts increased, and at political, military and macro level, social and political security clearly diminished, and directly and indirectly it affected the people's daily lives.

It can be established without doubt that the industrial resolution and the creation of the industrial society brought about new and worrisome phenomena in local and global security that were the omens of the security risks that plague our modern world and the upcoming decades.

In our days, in late modern history, we are witnessing a completely new kind of qualitative leap: a *knowledge based society* was formed, and the role of industrial centres were replaced by *knowledge centres* – the scientific and, as part of it, the digital revolution created an entirely new set of values. In addition to their positive values, unprecedented scientific achievements also create risks that threaten social, economic and human security, and even the security of the human race and the Earth. (We will come back to that topic when we discuss world models.)

The nature, character, and shocking effects of the accelerating time are indicated by data related to *changes of the population of the Earth* that we present in the below table containing statistical data. In order to better demonstrate the dynamism of the process, I focused on the doubling time.

Table 3
Predicted and past population of the Earth

Time	Population (million)	Doubling time (year)
10,000 BC	5	
7000 BC	10	3000
4500 BC	20	2500
2500 BC	40	2000
1000 BC	80	1500
0	140	1000
900	320	900
1750	660	850
1850	1200	100
1950	2500	100
1988	5120	38
2000	6000	
2011	7000	
2016	7500	
2085	10,200	

Source: Author's own compilation based on statistical data and accounts

A large-scale overview of the changes of global population clearly shows the accelerating rate of growth, the exponential acceleration which, considering that man is the only dominant intelligent terrestrial species, affects almost every factor that determines life on Earth, and all those problematic areas that are the critical in terms of humanity's future. From the growth of population, effects impacting on the complex aspects of security can be directly derived. In the first broad-strokes discussion within this chapter, that I will elaborate on in the part about world models, I refer to certain security-related unfavourable signs resulting from the fact that the *living space on Earth is becoming overcrowded*.

About half a million years ago, in the early stage of our development, groups and hordes of pre-historic men, including Samuel, who was found in Vértes, roamed the Earth: their numbers were estimated at ten to fifty thousand. Based on estimations, in this early age, it took *100,000* years for the population to double.

The first revolutionary change was marked by the emergence of agriculture when the *previous excessively long doubling time was reduced to one thousand years* – one tenth of what it was. Obviously it was still a very long time, but overpopulation issues did not exist then, the question of Earth's capability to sustain life did not arise, and ecological footprint was an unknown category.

The second revolutionary change occurred during the industrial revolution, when doubling time was further reduced to tenth of the previous one thousand years – *one hundred* years – between *1750 and 1850 (its value was the same between 1850 and 1950).* The alarm was already rung then: there was more and more talk about Earth's capability

to sustain life and its future, various theories and ideologies arose about the "usefulness" of epidemics and wars, claiming that their purpose is to curb rapid population growth (e.g. the theory of Thomas Malthus).

The growth rate of the population kept increasing, and while it was *2.5 billion in 1950, it was doubled by 1988, taking only 38 years to rise to exceed 5 billion.* By the end of the century and the millennium, there were 6 billion, by 2011 7 billion, while in our days 7.5 billion people living on Earth. These data reveal that doubling time is increasing – apparently, the curve reached its minimum in 1988 and now, after a local minimum, a slow increase will follow. Based on this curve, doubling of the population of 5 billion is expected in 80 to 90 years. There are heated debates about the limits of Earth's capability to sustain life: the estimates range between 6 billion and 200 billion.

The main problem, however, is not the absolute value of population numbers, but rather the heterogenity behind those numbers. The opinion of researchers, scientists, and professionals are unanimous: as long as the differences between the rich North and the poor South, and the troubling gap between the rich and the poor are not mitigated, the risk to Earth and its global security will continue to increase, affecting the citizens of the regions and the individual countries.

Unfortunately, we cannot even claim that the situation stagnates: on the contrary, it deteriorates even further, and an ever increasing percentage of the world's population live in poverty, lacking the ability to meet even their minimum needs. Poverty, lack of education, religious fanaticism, and economic pressure are breeding grounds for crime and terrorism as these people have nothing to lose. *In terms of security, these are basic inevitable questions.*

World models and security related deductions that can be made from them

The above outlined favourable and unfavourable signs of the accelerating time were strongly felt in the middle of the last century when it became evident that the economy and society of Earth and the use of natural resources took a new course that could potentially lead to a disastrous outcome. The *"civilization juggernaut",* the goal of which is to encourage people to consume as much as they can and the creation of mass production capacities that can satisfy the demand, has already been set in motion.

In the three basic subsystems of the earthly existence – in the workings of nature (the created world), economy (eco- and technosphere, the artificial world) and society – the disruption of the harmonious order is already noticeable.

Before the beginning of the 20th century, these three subsystems were interlinked without any major issues, and the "cogwheels" of the subsystems transferred their kinetic energy smoothly, and as a result there were no worrisome disturbances in the operation of the terrestrial system itself. By the middle of the 20th century, however, this situation changed for the worse, the economy came out on top and subdued the other two subsystems: economic (business and profit) goals became dominant. These clearly economic and business objectives led to the unscrupulous plundering of the valuable resources that nature amassed in millions of years, endangering the basic environmental conditions of life on the earth. In this process, humans were turned into biological robots, and the essential human,

emotional and economic conditions of human life were brushed aside. Human life is becoming uncertain, unpredictable and futureless, and the risk of desperation and irrationality in the way people act is increasing. *This sends an important message in the field of the safety policies of the 21st century to the people working on establishing the conditions of security.*

The above outlined detrimental process reached dramatic levels by the beginning of the 21st century, and escalated into a global economic and social crisis. The future of humanity is started to receive attention and became the focus of studies and scientific research, which *culminated in the foundation of the Club of Rome in 1968, and in the publication of world models under the auspices of the Club of Rome in the following decade.*

The formation of the Club of Rome was the first warning sign to people, leaders, and government officials, and the first instance of raising awareness that we are proceeding in the wrong direction and if we do not change course, it could lead to the destruction of mankind. This call appeals to human rationality and the instinct of self-preservation, and highlights the necessity for man to act responsibly. Human thinking and mentality must change, and the current path which is fraught with dangers as we have already noted should be abandoned for a better one. It is unfortunate that these necessities avoid the limelight and people tend to behave in the face of danger in a way that was described as the "problem of the 29th day". (The problem in nutshell: let us assume that on a lake plants that endanger the water surface appear, and their numbers double every day so in thirty days they will completely cover and suffocate the lake. In the first days the danger is barely noticeable, but after ten to fifteen days the serious threat is apparent, and it becomes clear that something has to be done to save the lake. However, due to their indifference, humans refuse to acknowledge the threat even after 20 to 25 days, when the situation becomes dramatic and, for all intents and purposes, the lake can no longer be used. Then we reach the 29th day and only one day is left to save the lake, but this uncertain rescue effort will cost a fortune. If a decision had been around the tenth day when the outcome was already clear, the lake could have been saved easily and at a relatively low cost. Unfortunately, they failed to act, but deliberately waited with an almost "suicidal" intent until the last and most uncertain stage.

For this reason, the scientists who established the Club of Rome decided to use the power of science to alert people to the fact that killer weed was already proliferating on the lake of our lives, and we need to take notice of them and act before it was too late. The *first world model* of the Club of Rome entitled *The Limits to Growth* (Meadows, 1972) was completed in 1972.

The computer model based on system dynamics essentially used the principles of *physical determinism* to build on statistical data from the past seventy years in order to extrapolate trends in the middle or at the end of the 21st century from those of the former period. Basically it sought to give an answer to the question of what would happen in one hundred years if the key processes (population, industrialization, food production, environmental pollution and depletion of natural resources) continued as we observed them in the past century. They developed 12 model versions, and using them they came to the conclusion that between 2020 and 2090 we will reach a critical point, the final limit of growth, imposed, by, among other things, the depletion of natural resources, environmental pollution reaching critical levels, lack of additional land areas for agriculture, and the emerging food shortage.

Based on the *wind-up world machine* analogy (which is a direct result of physical determinism), the authors of the model suggest that, similar to a real wind-up car, the spring

should not be wound any further, rather we should let the car roll until the spring unwinds completely. Thus, we need to reduce the rate of growth – putting the *zero-growth theory* to use in practice would be beneficial. (Obviously, developing countries protest vehemently against this approach as a 0 percent growth would conserve the current inequality between the rich and the poor. It is not a coincidence that at a conference in Rio de Janeiro, the developing countries decided to develop the *Bariloche model*, which, considering its methodology, also builds on system dynamics, but its database contains data relevant to developing countries.)

The Meadows world model stirred intense debates around the world – its obvious flaw is its philosophy that simplifies the trends in the world as a form of physical motion and assumes a homogeneous world (for example, they included a single birth rate in the model that is used to characterize global fertility in the given years). It is clear that there is a difference in the order of magnitude between the developed and the developing countries in that regard. The average value does not tell us much about populations that are heterogeneous and have a high variance intensity. The computer model is obviously based on mathematical formalism, which gives rise to the problem not unlike the above mentioned issue: the phenomena of the world are correlated in a stochastic rather than deterministic way, which precludes a description with scientific clarity.

The *second-generation world model* of the Club of Rome was authored by Eduard Pestel and Mihailo Mesarovic, and it is entitled *Mankind at the Turning Point* (Mesarovic–Pestel, 1974). In its approach and methodology, this model represents a step forward compared to the first world model as its basic philosophy is not physical but *biological determinism*, which is suitable for describing complicated processes, for example, how the seed grows into a flower, how a planted seedling becomes a fruit bearing tree and so on.

It is essentially a *computer model of organic growth* that is based on the following principle: nature, including the world system, moves along a path of growth, which can be described with a special logistical function and which is characterized by growth starting at high intensity from an initial low level and following a curve that can be described in this stage with an exponential function. However, as it reaches a certain level, *a turning or inflection point*, the growth rate is gradually reduced until it reaches the third and last part of the curve where a slow rate of growth or stagnation sets in. (Here the exponential function transitions into a logistical function.) The builders of this model believe that humanity is at this inflection point now, and depending on the decisions made in this period, it will either change course leading to global organic growth, or continue to rush forward at the current increasing rate.

Another step forward is the way the model handles world processes that the first model regarded as homogeneous: in accordance with the real nature of phenomena, it considers them *heterogeneous*, thereby distinguishing between the parameters of the individual regions. The model simulates economic, social and natural processes in ten regions, and determines the key indicators for each of these regions. The theses and conclusions of the model have been confirmed by the reality, and presumably they will also be applicable to the 21st century.

The hypothesis that the world can only be interpreted as a combined system of several region is essential. This statement is applicable to the entire economy and society, and we are justified in treating it as a basic rule for the 22nd century. An interpretation and study

of the phenomenon of security cannot ignore this hypothesis, in particular, because in *our days even local security has a global interpretation attached to it*. (It is enough to consider the specific criminal trends of each continent and their intercontinental influence, for example, in the case of the globalization of terrorist activities carried out by the Islamic State and other organizations.)

From the regional approach of the world model follows the conclusion that, contrary to the global collapse forecast by the Meadows model, it predicts probable regional crises in the next century. Reality confirmed this prediction as "bush fires", regional wars and crises breaking out in various parts of the world did not spread over to the other parts of the world and did not escalate to global level (for example, the Yugoslavian or Iraqi crisis, or the crises that broke out in seveal African and Asian countries).

An important conclusion of the model is that without a concerted global effort it is not possible to overcome regional crises. It is reasonable to extrapolate these theses and the conclusion of the model to the prediction made in regard to the security of the 21st century. Regional crises inevitably produce a number of negative phenomena that reduce the security of states and people, increase the sense of uncertainty, and trigger detrimental processes. Therefore we cannot be optimistic in that regard as relief and security will be replaced by a sense and the fact of uncertainty and unease in the following decades.

Out of the world models of the Club of Rome, we need to highlight two additional reports, *a common feature of which is that they are not mathematical but verbal models*, and the final conclusions of both can be easily applied to predicting the expected trends of security policies in the 21st century. In 1997, a report of the Club of Rome entitled *Reshaping the International Order – RIO* (Tinberger, 1976) was produced under the direction of Nobel-prize winner Dutch economist Jan Tinbergen. The model reviewed key subjects, such as armament, population growth, food and water supply, structure of settlements, pollution, natural resources, space, international institutions and the system of interdependency. Another world model, also dated 1977, was authored by a research team headed by Erin László, and entitled *Goals for Mankind* (László, 1977). *The final conclusion of both world models deals with the greatest problem of our era: how to secure our future. According to these reports, the future of humanity depends on eliminating inequality, and the international order must be reorganized to that end.*

Reports issued by the Club of Rome later addressed major secondary subjects instead of complex global issues:

- *Energy, the Countdown* (Montbrial, 1978).
- *No limits to Learning* (Botkin et al., 1979).
- *Dialogue on Wealth and Welfare* (Giarini, 1980).
- Road to the Future*: Towards More Effective Societies* (Hawrylyshyn, 1980).
- *Microelectronics and Society: For Better or Worse* (Schaft–Friedrichs, 1980).

The novelty and efficiency of world models lie in the fact that through quantitative and qualitative analysis they attempted to examine our world's economic, social and environmental issues in a realistic framework of correlations, striving to explore, measure, and analyze the relations and effects of the individual factors.

It is a regrettable fact, however, that problems revealed by the world models and reports of the Club of Rome were not resolved during the past period of almost fifty years, and in

several areas the tensions have further increased. The above statement is backed by the report of the *non-profit international organization OXFAM*[1], which is released every year at the time of the summit at Davos as a counter-example of the achievements of the world's most developed countries.

The OXFAM reports of 2016 states the following:

- in the past one hundred years, we never experienced inequality comparable to the current level on the earth,
- the wealth of the richest 1% exceeds the combined wealth of all the other people,
- the wealth of 62 richest men on the planet is equal to the wealth of the poorest 3.6 billion people,
- the wealth of the richest 62 people has risen by 44% since 2010, while the wealth of the bottom half fell by 41%,
- since 2000, the poorest countries have received just 1% of the total increase in global wealth, while half of that increase has gone to the top 1%,
- the average annual income of the poorest 10% of people has risen by less than $3 each year in the past 25 years, which means that their daily income has risen by less than a single cent.
- it is typical that the richest try to hide their wealth (to avoid paying taxes) – the estimated amount is 7,600 billion dollars, which is equal to the annual GDP of Germany and Great-Britain,
- wages continue to decrease compared to returns to capital,
- in the USA productivity rose by 72% between 1972 and 2014, while the salary of the workers grew only by 8.7%,
- the richest pose the greatest threat to the stability of the world: they have tremendous lobbying power, and they can devastate the environment and the society for the sake of profit.

The above statements are startling, and they indicate the omnipotence of economy and profit, and the almost unstoppable increase of their role and weight. The world models, the scientists and progressive forces of the world identified as a basic condition and a goal for humanity the mitigation of inequalities. In contrast, the current situation shows the sharpest, greatest and deepest inequality in the past century. (The example, cited by the president of OXFAM, stating that the 62 richest men who dominate the fate and progress of the world would fit onto a single bus, unlike the suffering billions.)

The inequality or gap between rich and poor that has been increasing for a century is the dominant factor contributing to the deterioration of security – poor, uneducated people who have no other opportunities constitute the active recruitment base of various crime groups, starting from international terrorism through the sphere of politics to violent crimes that plague our daily lives (robbery, theft, breaking and entering, crimes against human life, etc.).

At this time nothing indicates that this process would change for the better in the next decades, there is no sign that the voracious appetite of the capital for ever greater profits

[1] An organization founded in 1942 in Oxford, aiming to fight against, and to raise awareness of poverty and inequality.

would be curbed, and that it would take measures to eliminate inequalities threatening the future of the world. *This, in turn, indicates that in the 21st century a crime prevention and law enforcement strategy that is well suited for the new circumstances should be developed in every country, including Hungary.* An important element of this strategy is the strengthening of the official law enforcement and intelligence organizations in order to ensure that their domestic and international capabilities are boosted according to the prevailing global approach, and their focus should swift towards the risk factors resulting from the ever growing number of impoverished people living in the developing parts of the world.

At the same time, other important factors include encouraging the civilian crime prevention movements of the citizens and exploiting the fact that it is the self-organized communities that are in the best position to recognize the early signs of problems within the communities. *The only country-wide crime-prevention organization in Hungary that fits the above description is the Auxiliary Police (Polgárőrség), the weight, role and importance of which continue to increase.*

Quantitative growth must be necessarily linked to qualitative growth, considering the character of the low enforcement tasks that we are to face in this century, and the widening international cooperation in this field. Civil initiatives, combined with the professional skills of official organizations and agencies, can be an efficient way to act, the viability of which has already been proven.

Today, 80% of the planet's population live in the poorest half of the countries, and their numbers and percentage are increasing. Migration driven by the economic attractiveness of a small number of rich countries can be regarded as an objective and necessary process, the first signs of which are already observable. It is not unreasonable to assume that in the 21st century this process will be further amplified, generating cultural, economic and social problems that are almost impossible to resolve. Many people ask whether or not migration in modern history may become an unstoppable avalanche due to number of people involved if the rich and developed countries fail to take action against the growing inequalities. Beyond a certain point there is no physical barrier that could stop billions of human beings.

In summary, in the light of the trends and phenomena outlined in this study, we can come to the final conclusion that the security policy of the 21st century will be dominated by several new factors that require a new mindset, new answers to new problems, and a reinterpretation of security that makes sense at both macro and micro level.

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Klára Kerezsi – András L. Pap

The Future of Crime and Crime Control

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Abstract

Following a brief conceptualization of security and public order, we provide an overview of the factors that affect trends of criminality and law enforcement. These include an explanatory background for public order, the transformation of the concept of security (and the shifting boundaries of the rule of law), changes in the operational principles of policing, as well as trust in the police. Then we turn to the assessment of future trends to discuss demographic changes, macroeconomic factors, the technological revolution, globalization and political populism. We shall focus on models of criminal politics and the criminal justice system; this will be followed by the analysis of trends in criminality focusing on cost-benefit models, the demographic prognosis of young males, migration, unemployment, and trends in incarceration, and violent crimes and crimes against property. A subsequent assessment concentrates on future victims and perpetrators, the effects and consequences of crime, as well as challenges for the law enforcement machinery. In this section technological development, private security, the alienation of law enforcement, career prospects for a new generation of officers, as well as community and local policing, institutional discrimination and Roma-focused law enforcement strategies are discussed. The last section of the paper focuses on lacuna in research and regulation in the field of law enforcement.

Keywords: public safety, fear of crime, crime trends, crime control, penal policy, criminal justice, demographic changes, macroeconomic factors, technology revolution, globalization, punitive populism, trust in justice, private security

Public order and public security

Some people regard security as stability (permanence), while others believe that the key to security is the potential which lies in change (progress). Also, colloquial language and professional interpretations attribute different meanings to the concept. Typically, professional

interpretation construes this concept as national security, international military security, or information security. Sociological studies, however, established that the average citizens think about social security and public security when they hear this word (Gazdag–Tálas, 2008: 3.).

Public security, as Géza Finszter (2009) puts it, is the part of the immaterial infrastructure which is required for individuals and their communities to realize those of their goals that are valuable for the society. The contemporary European mindset regards public security as a collective product of the society, which consists of the activities of persons and their communities, official measures taken by public agencies, the citizens' self-defence capabilities, and services provided by the private business sphere. Public security is, therefore, a cooperative product (Finszter, 2009), a category carrying multiple meanings, in which various interests and values, and multiple tasks of profoundly different types are combined. Based on a review of studies in this subject, Podoletz (2014) points out that public security is closely related to the concept of public order, which is either defined as a formally existing situation or "order", or as a positive category imbued by value elements. In the legal system, public security appears as a component of public order, but the opposite can also be true when public order constitutes a part of public security, or they may be presented as equivalent categories (AB, 2001). It is apparent that there are a lot of ways to categorize them, but the constitutional value aspect of public security is more essential than any other interpretation. Nowadays, local, regional, national, integrated and global dimensions of public security gained special significance.

Factors influencing trends

Crime and public security are correlated concepts. A considerable amount of literature is devoted to exploring the factors that affect the trends of crime: why crime was on the rise in the 1960s, why it started to decline in the past two decades around the world, and what is to be expected in the future. This paper offers a compilation about the forecasted trends in crime, taking into account the facts, hypotheses and assumptions that professionals associate with future developments in criminal activities.

First of all, we need to emphasize that, according to the researchers of this subject, there are two variables which are indubitably related to past trends and future changes in crime: macroeconomic factors (e.g. the level of development of the economy, the rate of unemployment, characteristics of consumption) and demographic factors (in particular, the distribution of young males within the population, who are characterized by an increased propensity to commit crime). Today, technology was added as the third variable to these factors, which – as it will be shown – has an increasingly dominant influence on the instruments and methods of crime (Schneider, 2002).

The society that responds to an act of crime when it has been committed, which is characterized by "act of crime, perpetrator and victim, crime control, police activities, investigation, trial and punishment", is being transformed nowadays into a society that is characterized by "calculation, risk and uncertainty, surveillance, precaution, prudentialism, moral hazard, prevention and, arching over all of these, there is the pursuit of security" (Zedner, 2007: 262.). Literature related to public security claims that in the next decade the

conditions of handling crime will be dominated essentially by two characteristic features: on the one hand, *post-crime society* will shift towards *pre-crime society* that responds to abstract threats of crime (Zedner, 2007), and on the other hand, justice responding to the commission of an illegal act is more and more intertwined with the security oriented logic of threat assessment (Ericsson–Haggerty, 1997).

Interpreting public security

The changing concept of security – the crumbling boundaries of the rule of law

After the end of the cold war, security moved beyond the military interpretation of the concept. A key factor that influenced the shifting of this issue into focus is globalization, the "shrinking" of the world, with intensifying interaction of various regions and the balance of power between international actors that changed at the time and has been changing ever since.

The terrorist attack on 11th September 2001 against the World Trade Center drew attention to the "shrinking" of the world in a cruel way. In the aftermath, the war on terror opened the door to new possible interpretations of security related issues. The fight against terrorism became an international security problem, because – especially based on the concerns of the USA – it raised the threat of attacks with nuclear, chemical and bacteriological weapons. A new approach to the problem claims that, due to the aforementioned reason, economic migrants, refugees fleeing from conflicts, and smuggled people pose a threat to societies hosting them and even to those that are wary of doing so. Such an interpretation of international security regards jihadist terrorism and the 13 million Muslims living in Europe as a potential threat.

The new legitimacy of the police is related to its role in the fight against terrorism: its security related authority widens its mandate in regard to terrorism, but also restricts it as it is, in part, a return to its law enforcement role. However, the long process of "re-legitimization" may entail the reinterpretation of the legal concept of "citizen" as the new developments in connection with the prevention of terrorism indicate. The counterpart of enemy criminal law is the "citizen" who is entitled to all constitutional rights and the guarantee of due process (Gómez–Jara, 2008; Dubber, 2010; Jakobs, 2004).

In addition to new threats manifesting themselves in undeniably dangerous forms, there are still conventional threats, mostly religious and ethnic conflicts that threaten to disrupt the integrity of nation states. However, it is becoming increasingly apparent that in the dialogue about security policy these conventional threats are being replaced by issues such as illegal immigration from less developed countries, radicalization of certain groups within the society or the difficulties of integration.

By now the concept of security has absorbed several other fields that have never been associated with internal security before. Before 1991 there were barely any examples of internal security related issues that necessitated consultation between the European countries. The situation changed, however, owing to the problem of migration and terrorism, and it seems that in the future the issues of handling external and internal security will be even more interconnected.

The question arises as to "what extent the number of issues falling within the scope of the definition of security can be increased without jeopardising the intellectual integrity of the concept of security" (Gazdag–Tálas, 2008: 6.). The response of contemporary governments to the solution of issues related to the lack of security is *securitization* (Csiki, 2014; Gazdag–Tálas, 2008). The process has three stages: in the first stage, an issue that involves the community should be regarded as a threat, which means that it should be elevated to a level where the community interprets it as a danger to its conditions of life or an existential threat. In the second stage, the topic should be communicated using security related words, which would reposition the subject of the issues to the special category of security. This also indicates that the handling of the issue is undertaken by a group which was made responsible and given authority to act in matters related to security. In the final stage of the process, the public opinion accepts the phraseology related to the issue, thereby legitimizing the interpretation of the subject as a security issue (Buzan et al., 1998).

There are several issues that can be securitized either directly or indirectly. Organized crime threatens the security of the society and creates a parasitic relationship with the state. Large scale immigration evokes a sense of insecurity in the host country because the issue can be interpreted as the loss of national identity and jobs. Topics that threaten personal security are particularly suitable for securitization, for example when immigrants commit breaking and entering or sexual offences. This demonstrates that securitization is an "extreme" version of politicizing a social issues, and lays down the foundations of presenting a given issue as an existential threat, justifies the necessity of taking extraordinary measures, and legitimizes the crossing of the regular limits of political procedures. In this way, politics moves beyond the accepted rules, and the issue becomes embedded into a special political context or raises above politics (Buzan et al., 1998: 81.).

Nowadays, the inability to cope with globalization and the ensuing rapid societal changes and social uncertainty in connection with traditional values create a certain sense of social discomfort. And this social depression is here to stay in the long run. This means, in particular, one of its form of manifestation, the fear of crime, which absorbs, like a "sponge effect", abstract fears related to social situation, future and health. According to a Eurobarometer survey conducted across 27 countries, the intensity of the fear of crime differs significantly between EU member states. At the individual's level, the fear of crime is always stronger among women, persons with a low level of education, the unemployed and the city dwellers. The fear of crime is the strongest among those who regard themselves as socially marginalized and among people who see both their own future and the future of their country in a grim light. There is a comparably intensive fear among those who consider the social supply chain of their country less than adequate. Economic indicators of the fear of crime include the measure of economic inequalities in the country and low spending on education and social supply chain. In contrast, crime, migration, and the rate of unemployment did not show a positive correlation with the fear of crime (Vieno et al., 2013). This fact led researchers to the conclusion that the fear of crime is a component of societal insecurity and it is closely related to the basic need for social acceptance (Vieno et al., 2013). Braithwaite (1979) claimed that unfavoured groups of the society never have a determinant impact on the general trends characterising the frequency of criminal acts, and only economic measures can shrink the gap between the rich and the poor (Braithwaite, 1979: 231.). Only societies operating a capable educational system and social supply chain

built on egalitarian principles can reduce the fear of crime. Societies that promise their citizens direct protection and pursue zero-tolerance criminal policies cannot achieve such a reduction.

Operation of the law enforcement state

New players have emerged in the field of public security: local medical and social professionals, community and local government employees, and persons employed by other governmental agencies. Private security is becoming a key factor and so is security-oriented interpretation of the role played by banks and content providers. The rise of new the players necessitate establishing new forms of collaborations, and typically this collaboration will be the source of the special knowledge that will help the police overcome the challenges arising from crime. There is no doubt that cooperation with the new players has special significance in the fight against terrorism, and also in connection with handling environmental damages, radicalization, organized crime, and issues related to policing issues.

Policies intending to remedy the people's lack of security with the wrong tools may produce several adverse consequences. One of the most important outcomes can be that the issue of internal security becomes involved in military operations. The precursors are noticeable in Hungary too, which is further amplified by the securitization of the issue of illegal immigration. The previous division of labour assigned the army to home defence while the police was responsible for providing protection within the country. In the past two decades, the mandate of the police was considerably broadened as part of the fight against terrorism, and the powers given by anti-terrorism legislation shifted police activities even further away from law enforcement, and the surveillance and identification of potentially dangerous residential groups/individual citizens became increasingly important. The attention directed at the threat of terrorism and the part of the population that may be a potential source of problems changed the requirements related to the police: on the one hand, it militarized the police, and on the other hand, the local crime prevention role of the organization was transformed from law enforcement into threat management, and in the handling of petty crimes, the lines between the competences of law enforcement bodies and social services became blurred.

"Militarization is not just something that happens in war zones; when our government invests billions of dollars in war planes, prisons and the 'digital economy', while starving resources in social justice, education, the environment and culture, we are living the consequences of global militarization", wrote Berland and Fitzpatrick about the situation in the USA (Berland–Fitzpatrick, 2010). The overarching presence of militarization permeates even civilian culture. The culture of militarization is normalized through ethnicization, criminalization and securitization, giving rise to new forms of violence (e.g. hate crimes) and the emergence of various forms of dehumanization and othering, and builds a special "chain of fortifications" within white societies (Linke, 2010). The postmodern political system of Europe in the 21st century clearly demonstrates how governments can elevate themselves to a position of power over life and death: they have the power to exclude, to establish exceptions, and to drive a wedge between human life, human rights and societal values (Comaroff–Comaroff, 2007: 22.). In the postmodern society, a universal victim

mentality was born, which have a profound transformative effect on the management of social problems and the philosophy of crime control. This approach changes the attitude towards human rights, and in general people are becoming more tolerant to restrictions imposed on the rights of other people and their own rights, and to the use of control measures.

At the same time, the actors of local security are also changing, and the conditions of crime prevention are transformed. After all, security is turned into a commodity that can be purchased and yields profit. So much so, that, according to certain authors, security and law enforcement, provided not only as a private service but also as a state function, will be limited to what the customers, motivated by business considerations, expect from it. According to the radical views of Angus Bancroft (2005), widely shared by many scholars, the most important function retained by the nation state reshaped by globalization is to provide a peaceful and secure arena for the free-flowing international capital and the mobile workforce. These "secure locations", however, usually lead to segregation and the forcing of social classes that are considered "less secure" or "less competitive" into postmodern hyperghettos. The threat of terrorism drives the security industry into frenzied development; although it does protect the secure zones of the middle class, but at the same time it creates a "grey zone" for the excluded people, where private (or quasi-private) security services for the wealthy will grow, while public law enforcement will be mostly reduced to maintaining police control of the classes that are lagging behind: while middle and upper classes are given preventive protection, the poor will only experience reactive law enforcement.

Professionals studying cohesion within the society conceived the notion of "parallel lives" (Cantle, 2008; Burgess–Lupton, 2004) to describe a situation in which social groups live next to each other, but there is no contact between them. This concept is based on the social experience where there are communities that, not just in terms of their territories but also in regard to their social and cultural levels, are isolated from each other. This segregation is more than simply geographical separation. If members of the different communities are in contact, if not geographically, but in other areas, such as education, employment or recreation, then these shared spaces will provide enough information about the other group to compensate for the effect caused by geographical separation (Cantle, 2008). However, segregation described by the concept of parallel lives carries the risk of a social disaster. In Hungary, the lives of the Roma and non-Roma groups of the society seldom cross each other: they do not go to the same school, do not work for the same employer, do not shop at the same place, do not live in the same neighbourhood, and, as a result, their future children will not play on the seesaw at the same playground either. To simplify the situation to a certain degree, we can claim that they only meet at a single location: in the field of criminal justice, where the "service providers" of criminal justice came from the favoured class while the "users" are typically from disadvantaged social groups (Kerezsi, 2013). It is easy to realize that in our society criminal justice provides the arena where dialogue between different social classes and cultures takes place (Kerezsi, 2013). The analysis authored by Herbert Gans concerning "the uses of the 'undeserving' poor" is noteworthy in this context (Gans, 1992). If no effective social measures are taken in order to dismantle barriers between communities so dialogue may start and mutual trust and understanding may improve, then prejudices will continue to plague these relations, which, as a result, supports the forecast that extremist groups will spread, racial and religious discrimination will increase, and disadvantages and inequalities will be even more prevalent.

Policing is easy to see as it attends to people in need (e.g. the law enforcement state's efforts to achieve dominance is indicated by the interpretation of communal work as a law enforcement measure instead of an instrument of social policy). One of the consequences is *overpolicing*, an excessive response to the behaviour of disadvantaged social groups, and their closer monitoring. These social groups, however, are left without real protection; even though their members are overrepresented among the victims, the conventional police mindset does not regard the protection of victims, cases of family violence, etc. as a "real" police duty. As a result, difficult to reach social groups are becoming even more difficult to approach.

Collaboration changes the boundaries of professional competences, and reallocation of measures opening the door to the legitimate use of force is a phenomenon that is on the rise. The latter is the most significant change in the past decades, and is driven by legislators delegating "policing and sanctioning" powers to non-judicial organizations. An example of this process is the judicial sanctioning powers that are "redistributed" in the context of diversion, which is one of the signs that indicate a shift in the balance between the players in criminal justice (Kerezsi, 2006). Diversion boosts the involvement and the powers of prosecution in criminal procedure (Kerezsi, 2010). Another example of the redistribution of policing powers enabling the use of legitimate force is the establishment of public area surveillance organizations and the restructuration of disaster management. Giving broader policing powers leads to an increase in the number of inmates, and if it is not followed up by sufficiently expansive prison construction projects, ethical, political and budgetary problems will ensue. An example from our country: according to the Hungarian Helsinki Committee, prisons in Hungary are the most crowded in Europe. The number of incarcerated persons has been increasing since 2008; in 2014, the average number of inmates was 18.204, the average occupancy was 141%, which means that more than 18.000 persons were crammed into a prison capacity of about 13.000 inmates (Kirs, 2015; Klemenics, 2015). In its ruling of March 2015[1] (in the case of Varga and others vs Hungary[2]), the European Court of Human Rights declared that overcrowding of Hungarian prisons is a systemic problem.

The penal state successfully converts anxiety arising from globally increasing insecurity to anxiety and hate associated with criminals or certain minorities (Ferge, 2014), and tolerance is replaced by a vision of an enemy that threatens security (Fleck, 2014). If priorities in social policy do not change, and instead of ensuring the functioning of social policy instruments against insecurity, poverty and increasing inequalities, it prefers penal solutions, then social policy will be a subservient part of penal policy (Nagy F., 2014). Current trends show that ranking security above all shifts institutional practices from consensus towards coercion, from social welfare and integration functions towards the intensification of surveillance and policing, and criminalization.

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[1] Systemic issues related to the conditions of detention have also been found by the Commissioner for Fundamental Rights and the European Committee for the Prevention of Torture and Inhuman or Degrading Treatment or Punishment (CPT) of the Council of Europe. See e.g. http://helsinki.hu/wp-content/uploads/Varga_v_Hungary_osszefoglalo.pdf

[2] Varga and others vs Hungary, case no:14097/12, 45135/12, 73712/12, 34001/13, 44055/13, 64586/13, JEMA, 2015/3, 75–81; and also, Klemencsics Andrea: Embertelen fogvatartási körülmények a magyar börtönökben, Arsboni, 23rd March 2015.

Trust in justice

Societal controls do not work properly if citizens do not trust the institutions and their willingness to abide by the laws is poor. The surveys conducted by Eurobarometer in the EU measure from year to year what the people think of criminal justice, how they trust the legal system of their countries, how secure they feel and so on. In our experience, the lack of trust and the security deficit are higher in the Easter-Central-European region than what would seem to be justified on the basis of objective data about security (at least, data that appear to be more objective than opinion polls).

Trust in criminal justice is a fundamental requirement of the democratic operation of a society. Lappi-Seppälä used data from Western-European countries to prove the correlation between the proportion of prison populations and the trust in the given country's legal system (Lappi-Seppälä, 2004). In countries where adherence to social norms is not based on fear and deterrence but on maintaining trust and legitimation, the latter goal can be achieved by applying less severe legal sanctions. When supplemented with data from Eastern-European countries, the data examined by Lappi-Seppälä make it even more evident that handing out prison terms is not the most successful way of shoring up trust in the legal system and reinforcing its legitimacy.

Findings of the Eurojust project presented the issue of trust in criminal justice as part of broader context. As it stands, the issues of a "good society" have been contemplated as political problems, subject to political considerations. The findings of the aforesaid study confirmed that political trust is strongly related to the subject of welfare – as Mike Hough put it: inequality of income is the friend of crime and an enemy of trust in the society (Hough–Sato, 2011).

Rober Reiner (2011) argues that the police mostly serves people who are in trouble, this is its most important function, and for this reason criminal statistics are unsuitable for evaluating police activities as the police have little influence on criminal trends. During its historical development, a special emphasis was placed on the investigative function of the police while providing support for general law enforcement tasks and social services were devalued (Dempsey–Forst, 2014: 68.). According to the classic research by John Webster (1970) in a city with 400.000 residents the police spends 55% of the police officers' working hours on providing services and administrative functions, and 57% of the reports require such tasks. Crime investigation takes up only 17% of the working hours. A 4-month study conducted in Kentucky (USA) produced similar results: 61% of the incoming calls were information requests and 13% were related to traffic issues. Less than 3% of the calls reported violated crimes and about 2% were about theft (Dempsey–Forst, 2014: 136.).

A study regarding trust in the Hungarian police (Boda–Medve–Bálint, 2015) indicates that micro-factors determining trust in justice are not different from those in the Western democracies. Trust in the police is determined basically by its performance and the fairness of its procedures, but a factor that is just as important as the previous two is the opinion of persons under investigation about the current problems of the country. Persons interviewed in Hungary are sensitive to the subject of police corruption, but they are much more tolerant to discriminating police practices. Additional findings of the research confirm that positive personal experience in connection with the police does not improve

the overall positive view of the police any further, however the opinion of those who had less than favourable experience in a police procedure became negative in every respect.

Table 1

"How much do you personally trust the police?" (2013; 2015)

Year	Averages by gender			Averages by age groups						
	male	female	to-gether	16–24	25–34	35–44	45–54	55–64	65–74	74 years or older
				years old						
2013	5.6	5.8	5.7	5.7	5.7	5.6	5.5	5.6	5.8	6.1
2015	5.6	5.7	5.6	5.7	5.8	5.6	5.6	5.5	5.5	5.9

Source: www.ksh.hu/docs/hun/xstadat/xstadat_eves/i_zaa012.html

Factors determining future trends

"Criminal trends can be considered stochastic processes, which means that while both their past and the contemporary social phenomena have an impact on their future, these effects, however, are not causal, the degree of interaction is not a constant value but a random variable. […] The annual crime rate affects that of the next year, but it is just not possible to specify a multiplier that could be used to calculate the value for the next year. The same is true for other phenomena indicating how deep rooted crime is in the society, such as the rate of unemployment or population numbers in the age groups that are the most active in crime", wrote Mátyás Arató, Imre Kertész and Vilmos Tisza 15 years ago (Arató et al., 2002: 4.) in a study aiming to forecast crime. Even then changes in the level of technology (decline, stagnation, development) were regarded as an uncertainty factor, but a potential third industrial revolution was not excluded either. The verdict on the issue of migration was similarly dubious: in their words, the member states might close their borders, but they might also open them to varying degrees. "Globalization might create a world without borders, but it may also resurrect regional isolationism, and lead to a global crisis" – that is how they outlined the difficulties of tackling the task at hand (Arató et al., 2002).

The mentality of our day struggles with similar hurdles when contemplating the possible turning points or persistent characteristics of crime and the handling of crime, and for this reason it resorts to the evaluation of processes that emerged not just in our country but in other European countries too, thereby amplifying the examined trends.

Demographic changes

As we have already mentioned, future trends in crime seem to be profoundly influenced by the current demographic changes that are expected to continue in the future. A review of the age distribution of the population reveals that the most significant factor is the

number of 15 to 25-year olds, especially the percentage of young males. In societies where the population in this age group shrinks, a declining trend in crime can be expected. The decreasing number of young people in Hungary points to a further drop in the already declining trend of criminal activities. At the same time, demographic characteristics represent only one of the contributing factors that drive crime. Crime can be on the rise despite shrinking young age groups if members of these groups are less integrated, their educational levels or qualifications are poor, and they do not work and do not study either. Within the age group of young people, minority youth may also appear as an additional "source of problems". Among the young males who commit crimes, professionals with hands-on experience clearly notice the "macho" behaviour pattern, which is inspired by movies, advertisements, and computer games. Professionals call this phenomenon "tough-guy context" (Jefferson, 1996) as the young people interpret the aspects of a situation that is not beneficial for them using the notions of "toughness". This scope of interpretation can be so widespread today, typically among the deprived young males, because they do not have any real social power as they are uneducated and unemployed, but they live in a culture that imparts the values of patriarchal power to them. The studies of Sophie Body-Gendrot (2005) showed that even violent juvenile delinquents do not have direct path from minor infractions to committing mafia-type offences and acts of terrorism. Commitment to a law abiding conduct is compromized mostly by the deficiencies of socialization, which lead to a lack of respect for the law. Poverty does not affect the development of a macho attitude, but preference for computer games in which the objective is to kill everyone else *("beat them up games")* and for violent media programmes is closely related to violent behaviour (Bakóczi–Sárkány, 2001). Propensity to use violence as a norm may indicate in a lot of different ways that arenas for legitimate competition available to this age group are either scarce or unappealing. Similar to money and knowledge, violence may be a means to gain power, and many young people have no other way to exercise power. Not to mention that in addition to being able to learn how to become violent, one can also learn how to normalize and rationalize violence and how to evade compliance with moral obligations towards other people. The shrinking of the Hungarian demographic group, which is beneficial in terms of the reduction of the frequency of criminal acts will not necessarily lead to a reduction in crime. For now, however, data gathered in Hungary point to a further decline in the number of perpetrators and criminal acts.

The other consequence of demographic changes (due to prolonged life expectancy thanks to advances in medical sciences and technology) is a significant increase in the age group of elderly population. Globally, people live longer than in the previous decades. The number of elderly people increases in Europe in the first place: in the past 60 years, the European population older than 65 years tripled and the number of people older than 80 years is six times what it was in 1950. This situation carries the risk of the elderly being exposed to an increased number of criminal acts exploiting their vulnerability, including, in the first place, various frauds and crimes against property. Experience shows that this age group is more trusting and pays less attention to preventing crime. It is expected that the number of violent acts against the elderly that, in many cases, remain latent, will also rise. The growing number of elderly people will not only change the characteristics of crime but, based on experience, the elderly have different expectations in regard to the organizations of law enforcement.

Table 2

Changes in age groups of 15- to 25-year old people and those over 60 and forecast of their distribution in the Hungarian population (1980-2025)

Time period	Population on 1st January (persons)	Male population aged 15 to 25	As a % of the population	Population older than 60	As a % of the population
1980	10,709,463	852,309	7.96	1,830,132	17.1
1985	10,657,420	765,076	7.18	1,921,935	18
1990	10,374,823	801,829	7.73	1,959,846	18.9
1995	10,245,677	902,988	8.81	1,986,313	19.4
2000	10,200,298	862,914	8.46	2,081,559	20.4
2005	10,097,549	755,614	7.48	2,152,120	21.3
2010	10,014,324	706,890	7.06	2,252,965	22.5
2015	9,855,571	652,924	6.62	2,472,802	25.1
2016	9,830,485	641,126	6.52	2,521,684	25.7
2017	9,735,621	619,066	6.36	2,531,577	26
2018	9,693,531	601,749	6.21	2,546,547	26.3
2019	9,651,940	585,537	6.07	2,556,891	26.5
2020	9,610,945	571,996	5.95	2,561,683	26.7
2021	9,570,535	561,570	5.87	2,565,310	26.8
2022	9,530,739	553,911	5.81	2,563,763	26.9
2023	9,491,479	547,659	5.77	2,555,276	26.9
2024	9,452,153	546,258	5.78	2,549,993	27
2025	9,412,663	546,276	5.8	2,545,891	27.1

Source: Author's own chart based on data from Central Statistical Bureau

Macroeconomic factors

For now, economic indicators point to the continuation of the trend that was experienced in the past 5 to 8 years. A number of research projects confirm that the frequency of criminal acts, especially crimes against property, is closely related to the level of economic development. This does not just mean that at the time of an economic crisis crime against property starts to exhibit a rampant growth, but also that at the time of an economic boom it drops. It is a fact that in a period of prosperity the number of people who have a job and the amount of money they earn are higher so committing crimes against property is less attractive to them. It is also a fact, however, that a developing economy produces an abundance of goods and a wider choice of opportunities for crime.

In the domestic trends of crime – in particular, crime against property –, macro-economic effects are easy to track. The economic opening in the 1970s and the wider range of opportunities to do extra jobs (small economic associations called GMKs within companies)

allowed several classes in the society to start accumulating wealth. Economic opportunities were quite limited in terms of meeting individual needs (accommodation, food, etc.) at a higher level, and barely allowed for an increase of consumption involving properties, investment projects as well as technical and accumulated assets. The time for the latter arrived with the regime change when economic and political opening created unprecedented supply of consumption and investment opportunities that were unimaginable in the previous decade. Then the above mentioned accumulation of assets found its consumption target. This change was reflected in the skyrocketing of crime rates, which also indicated that the appearance of high-value consumer goods in households and at private companies did not entail the use of efficient security measures. Availability of investment sources to citizens but their lack of financial skills led to the sudden proliferation of pyramid schemes. These days the constant decline of crime against property is mostly due to the prevention oriented mindset that implements the right security measures to protect assets (Dijk et al., 2012). The citizens' lack of skills in the area of finances and in investment issues, however, were marked by frauds (mostly investment frauds) that have been flourishing ever since.

Technology revolution

Industrial revolutions have a definitive impact on the methods of production. The first industrial revolution was marked by the invention of the steam engine, the second by the use of electrical energy for mass production, the third by applying information technology to production automation. In this stage, production is being digitalized through the use of intelligent software, new materials and work processes, massive robots, web-based services and so on. Schwab (2016) argues that the start of the fourth industrial revolution will be probably triggered by the blurring of the boundaries between physics, biology, and digitalization.

Development of technical equipment has a significant impact on trends in crime. New technical solutions offer easy access to systems, not just for legitimate users but also for criminals with a lot of technical savvy. Advances in technology loosened the connection between crime and geographical locations, and can fully ensure the anonymity of the person committing the unlawful act. In the next decade, the Internet will be the prevailing interface for criminal activities, and as a result, we can expect an explosive rise in IT crime. Technical changes facilitate even the conventional forms of crime (e.g. theft, counterfeiting, money laundering, scam, child pornography, etc.). So, in part, technical changes modify the conditions of committing conventional crimes, but in doing so they also expose services to unprecedented forms of attacks, which may cause serious harm or damages, and had been unfeasible before. We cannot stress enough the fact that in that regard the population's distribution among age groups has particular significance. The point is that young people aged 15 to 25 are very skilled – more skilled than any other age groups – at handling the devices of information technology. And people older than 65 are the least skilled in using IT technology.

Development of technology has a three-pronged effect on future trends in crime: first, it helps perpetrators commit conventional crimes using new instruments (e.g. scam, theft, money laundering, counterfeiting). Second, the technical equipment itself is the target of criminal activity (e.g. theft of telecommunication devices, spreading of viruses, etc.). Third,

the new technology is used for prevention or detection of crime. The rise in the number of various forms of counterfeiting has a causal relationship with the technical development of personal computers, scanners, colour printers, etc. The number of frauds committed using electronic devices will rise as the adoption of automated bank transfers and online banking will spread, offering more opportunities to commit online theft and fraud.

Development of conventional and IT technologies, however, also helps the police, for example, with the analysis of criminal activities. In the future, statistical analysts will be aided by various software applications, and evaluation of registered acts of crime will be an automated process supported by technical devices and computer programs. In addition to the traditional methods of data collection, gathering so-called "Big Data" will also be a source of knowledge about crime – in the latter case, data used in the analysis are generated constantly and at a high rate. Big Data collection provide data in real time together with their changes, and evaluating them will always reflect the current situation (Nagy T., 2015). In the words of Tibor Nagy: "For example, the Hungarian National Police Headquarters (ORFK) release an Internet-based crime map on the home page of the police that can be searched down to street level. Statistical data from investigations are published on the page and are used to visualize the crime rates – in this way it is directly observable which territories are safer than the others and which areas require increased police presence. The so-called *smart city* projects involve collation of unstructured data streams (e.g. camera captures) in real time from several sources at a number of locations and geocriminal statistical data for the purpose of crime prevention" (Nagy T., 2016).

Advances in technology automatize a number of analysis tasks, such as fingerprint and DNA analysis and vehicle identification. Also, this technology supports surveillance, monitoring and patrolling activities. As it has already been mentioned, certain instruments of crime control are "migrating" to other areas and certain solutions are adopted quickly in the law enforcement practices of various countries. Satellite and electronic surveillance systems will probably represent such a rising technology.

Globalization

Development of telecommunications, rising international trade, growth of tourism and other travel activities, and migration rendered borders negligible for criminals and criminal groups. In the future, the number of perpetrators who have never entered the territory where they committed their crimes will grow even more. The globalized market led significantly reduced the risk of getting caught while smuggling legal and illegal goods, and created an excellent opportunity for international organized crime groups (Wardlaw, 1999). A human smuggling network was built around the masses migrating from the conflict zones of the world (or just in the hope that they will find a better life). International organized crime groups can exploit the fact that investigation of crimes and criminal justice continue to operate within the jurisdiction of nation states.

In the European concept of security, significant changes were introduced by the European Union, which brought the members states closer to each other by opening the door to the free movement of goods, services, capital, and persons. Development of telecommunication devices, the Internet, and the revolution of technology amplified this interaction. These

changes threw a different light on the problems associated with external and internal security on the continent. Some of these changes directly affect the security of people. Migrants, refugees, and applicants for asylum illegally crossing the borders have no intention to harm their target countries, rather they desire security, a better life, and success for themselves and their families. Obviously, there are also groups that have clear harmful intents: cross-border organized crime, human smuggling, drug and arms trafficking, cigarette smuggling, human trafficking, and the various forms of modern age slavery are all illegal activities that aim to maximize profit (EC, 2008). The aforesaid criminal phenomena as manifestations of organized crime have already been encountered by the law enforcement bodies of the individual countries. Intensity of the forms of cross-border crime create a new situation for the investigative and law enforcement systems of each state. It seems that militarization of the police, outlined previously as background information about the handling of crime, creates favourable conditions and the use of a "common language" in the collaboration of law enforcement organizations, special police units and certain elements of the armed forces, within and between countries.

In the global system of the division of power, the weight of Europe diminished and this trend is expected to continue in the future. The EU expanded to the geographical borders of European identity (Marsh–Rees, 2012: 161.), but it was exhausted by the conflicts ensuing from the expansion. The new neighbours it gained as a result of its expansion are less secure, less accepting of the European values and norms, and are more dangerous than before (Marsh–Rees, 2012). Brexit too can be attributed to this process. The interest of the USA is diverted towards territories outside Europe. When European countries analyze their own security, it is difficult to determine which priority is higher: problems posed by the recovering Russia or the North-African and Mediterranean region (Buzan et al., 1998). Europe considered the economic influence of globalization (so far) and was subject to its effects during the crisis of 2008. However, it was only able to think in a linear way that was restricted to the influence a center exerts over the peripherals. The current process and extent of migration forces the centre to face cultural influences from the peripherals, however Europe does not seem to be sufficiently prepared for it. The reason, among other things, is that this cultural influence is associated with imagined or real security problems such as illegal immigration or the threat of terrorism. The final outcome of this process cannot be seen yet, but the issues around migration in Europe do not suggest a success story at this time...

Populism

From Le Pen to Trump, populist political rhetoric is a phenomenon that is spreading all over the world, relegating law enforcement to a role subservient to politics. "Security" and "enemy" are the core concepts in these campaigns and in political dialogue, often with completely disregard for data that can be obtained through scientific analysis and a variety of studies.

Responses in penal policy and criminal justice

Without doubt, operation of criminal justice and the magnitude of sums spent on it, technological readiness of crime control, efficiency of the penal system, and existing and missing systems of crime prevention all have an impact on the trends of crime. Technological enhancement of law enforcement (in regard to identification of persons, monitoring of drug trafficking, etc.) is one of the best investments in curbing crime.

Globalization does not only transform crime, but penal policy will "emigrate" and instruments of crime control will "immigrate" too. A crime control solution can be attractive for the government of another country, such as the "three-strikes" legislation or the introduction of neutralization among the objectives of punishment. Such "cross-talk" suggest the spreading of punitive populism (Gönczöl, 2015; Fleck, 2014). Punitive populism is a penal policy which aims to meet the assumed or real expectations of the public, thereby gaining political popularity (Gönczöl, 2014). Punitive populism can be blamed for the appreciation of incarceration among the punitive measures, and in certain cases the widening gap between the assumed value of the punishment and its proportionality in relation to the crime (e.g. actual life sentence). A new development, which is expected to gain momentum, is that in regard to sanctions not involving detainment (which were only related to personal characteristics) expectations of proportionality in relation to the crime have appeared. Alternative sanctions are used more frequently, but there will not be fewer prison sentences unless economic considerations begin to influence penal policy. It may also happen that penal policy will be directly affected by budgetary criteria. This process can be bi-directional: on the one hand, a strict penal policy complemented by a human rights rhetoric aiming to reduce the overcrowding of prisons may trigger a wave of prison building projects that may give a boost to the labour market and, depending on the circumstances, to the building industry.

Let us see the example of the United States: between 1979 and 2000, 137 prisons were built only in Texas. However, the maintenance costs of penal institutions may induce trends in the other direction. Prison population in the past three decades grew from 270.000 to 1.3 million, generating an outlay of 50 billion per year, with about 0.5% of the adult population serving various terms in 2007. (6% in Alabaman, Mississippi, Oklahoma, and Texas, and 8.5% in Louisiana.) It is important to note that it occurred independently from criminal and detention statistics, without any correlation with them.[3]

Besides penal policies becoming stricter, lack of reintegration also increases prison population: according to a study made in 2011, more than 40% of the prisoners released in 2004 were back in prison by 2007. This is, of course, partly due to longer terms handed out in accordance with the mandatory sentencing requirements: for example, between 1988 and 2012, the average term served by persons incarcerated in federal prisons more than doubled, growing from 17.9 to 37.5 months (MacDonald, 2013).[4] We should also bear in

[3] See e.g. www.cbpp.org/research/changing-priorities-state-criminal-justice-reforms-and-investments-in-education

[4] See e.g. States Cut Prison Costs; Can Federal Government Do the Same?, Winter 2016, http://magazine.pewtrusts.org/en/archive/winter-2016/states-cut-prison-costs-can-federal-government-do-the-same

mind that medical services provided to inmates serving long sentences who are growing old increase costs even more.[5]

Maintenance of prisons in the USA is the third biggest budget item after education and healthcare, which grew between 1986 and 2013 from 4.7% to 7%, but amounts to more than 11% in certain states (Arizona, Michigan, Oregon, and Vermont) (Mitchell–Leachman, 2014).[6] California built 23 prisons between 1982 and 2000, for a cost of 280 to 350 million dollars each, to address a more than 500% growth of prison population. By 2005, there were 616 inmates for every 100.000 adults, amounting to more than 6% of the adult population. In 2011, the federal supreme court[7] ordered a reduction of the prison population to no more than 137.5% of the prison capacity. These efforts, in the end, fitted in with the government's cost reduction policies as the maintenance of prisons amounted to no less than 7% of the budget of 2013 and 2014, and in time, the conservative, often populist rhetoric demanding strict penalties subsided.[8] In a few years, New York, New Jersey and California reduced its prison population by about a quarter (Mitchell-Leachman, 2014).

A significant change started in the responses of the state to acts of crime, and we can expect this trend to definitely continue in the future, especially as a result of European immigration and the acts of terrorism that have been committed. In this process, commission of a crime is not a mandatory prerequisite of the use of force by the state: detection of a threat, a risk assessment, or an expression of the lack of security may be enough to produce a restrictive state response. A society that focuses, in particular, on policing and risk management will put the emphasis on the elimination of threats at all costs. There is no doubt that such efforts carry a different kind of danger: the threat of leaving the criminal law behind in that even though the regulation will formally stay within the boundaries of the law, it will break away from the traditional fundamental principles and values, and in the handling of crime criminal law, in the traditional sense, is separated from the so-called "enemy criminal law". This regulatory procedure will stay with us as long as the population's fear of crime justifies it.

Fundamental principles of criminal law determine the operation of criminal justice for 200 years. At the end of the 20th century it became apparent that globalization and the postmodern state that was born from it may interpret those fundamental principles and the limits of the state's punitive powers differently (Szabó, 1993; Gönczöl, 2002). In the past 30 years the boundary areas of criminal justice in which the lines between the competences of criminal law are getting blurred are clearly visible.

Enemy criminal law, different from civilian criminal law keeping within the limits of the rule of law and drawing on the status of law-abiding citizens as persons, basically deprives certain individuals posing an extreme threat of their status as a person, treating them merely as a source of danger who are not entitled to the guarantees of due process and other constitutional principles. This indicates a shift towards preventive, pro-active protection under criminal law and sanctioning the abstract offence of posing risk; in practice

[5] Between 1990 and 2013, the number of incarcerated persons older than 50 years grew from 4% to 21%. www.ppic.org/main/publication_show.asp?i=702

[6] See e.g. www.ppic.org/main/publication_show.asp?i=702

[7] Brown v. Plata, 563 US 493 (2011)

[8] See e.g. The 2014-15 Budget: Administration's Response to Prison Overcrowding Order, February 28, 2014, www.lao.ca.gov/reports/2014/budget/three-judge-panel/three-judge-panel-022814.aspx

this is a transition from criminal legislation to wartime (combative) legislation involving preventive or extended detention or monitoring after serving a sentence, employed mostly in the context of terrorism. The "perpetrator" in this case faces severe forms of sanctioning if s/he threatens to commit an act even though no preparations have been made to actually go through with it. Essentially enemy criminal law means that, for example, in regard to terrorism, terrorists pose such a serious threat to the society simply by their existence that moving the boundary of punishability forward is justified, that is to say protection should not be extended only to preparatory behaviours as provided by the substantive law, but prior to those behaviours, measures must be taken, if possible, against acts that will be committed, preventing them from getting into the "preparatory" phase (Bartkó, 2010; Nagy F., 2006). In addition to counter terrorism, enemy criminal law is also used against organized crime, and in cases of insurance fraud or against persons with a mental disorder.[9]

Extending the scope of intervention under criminal law, the use of force by the state is employed to address a growing number of phenomena. Basically this is done through legislative measures, which has a two-fold effect. On the one hand, the line between a criminal act and an act of war is removed, and the areas of operation of home defence and law enforcement get fused. This development is clearly noticeable as the police joins in the fight against terrorism. Another consequence of this phenomenon is that law enforcement agencies are getting involved to an ever increasing degree in peacekeeping operations, which, in turn, may amplify the militarization of the police. On the other hand, legislation makes less and less distinction between crimes and less severe public-order offences (misdemeanour, administrative infringements). Blurring the lines between criminal justice and law enforcement will entail the proliferation of measures typical of criminal justice in the legal basis of law enforcement, but without the guarantees of the former (Nagy M., 2012). The number of the various behaviour patterns that open up the door to the use of force by the state will rise significantly, and the number of institutions (penal institutions, border troops, local law enforcement agencies and the private security sector) operating in this field and their areas of competence will be boosted to a great extent (Hörnqvist, 2004). Operating principles of these organizations is only driven by the overarching logic of risk mitigation and security. The question arises if this means that the system does not function as it should or if it no longer functions as it did before.

In addition to the broadening of the scope of measures needed for providing security, we can also notice that the interpretation of security has a different target group now. Increasing overall security is losing significance; instead, priority is given to determining whose security is involved and what or who threatens it. This kind of security mentality is counterproductive as it improves security by using methods that are, in fact, reinforce the conditions threatening security, as stated by Hörnqvist (2004).

Nowadays political dialogue about public security pays less attention than it should to solutions that have a direct impact on trends in crime. The inequality of incomes is significant within the EU (EC, 2010) and in the members states, and the gap is expected to widen even further. Employment is not an assurance against poverty as job opportunities

[9] Out of the cases heard at the European Court of Human Rights, see e.g. Morsink v. Netherlands, May 2004, Application No. 48865/99., M. v. Germany, 17 December 2009, Application no. 19359/04., Haidn v. Germany, 13 January 2011, Application No 6587/04. Vinter v. United Kingdom, 17 January 2012, Applications nos.66069/09 and 130/10 and 3896/10., Schummer v. Germany, 13 January 2011, Applications nos.27360/04 and 42225/07

are typically dominated by fixed term temporary job offerings in the labour market (EC, 2010). More frequently the police is expected to prevent crime in a neighbouring area. This is so because it is easier to secure funding for local initiatives if they are meant to prevent crime. However, in this form of collaboration, law enforcement expects social services ever more often to perform constant monitoring, shaping those services in their own image. "Penalization of the social sphere" is a real threat today, which is reinforced by the vision of a security providing state that arises after the dismantling of the welfare state.

Changing crime

In the coming years, global economic depression, ongoing migration between continents, deepening inequalities, crumbling constitutional frameworks, and the spreading of social media will also affect the trends and the handling of crime. It seems the most decisive change in the nearest future will not be a quantitative shift in crime but a change in its nature and its complexity. Such a change is, for example, the entanglement between wars and the organized forms of terrorism and crime. One of its most dangerous forms is human trafficking and human smuggling. Money laundering and illegal trafficking in works of art also suggest the same change as new pieces enter the illegal distribution of works of art from sites in war zones and destroyed public and private collections and then the money earned in this way is transferred back to warlords. The density of population is increasing, there are a lot of settlements in the danger zones, and climate change also augments risk factors related to human safety. We need to take serious environmental threats into account (Scheffran–Battaglini, 2011).

Factors explaining the trends in crime

Based on experience gained from research, five factors can be used to provide a fairly accurate description of changes in crime trends.

1. Opportunity cost
   Opportunity cost is the yield of the most probably selectable alternative, which may directly affect the possibility and the conditions of committing a crime. It includes the number of people serving in the police, the prison population numbers or the rate of unemployment. In particular, the strength of the police force and the prison population support deterrence and neutralization, and – mostly through legislation – politicians can directly influence these effects.
2. Young male population numbers
   It is a well-known fact in criminology that from a statistical point of view crime is typically committed by young males. In the period between 1970 and 2008, the proportion of young males increased in European countries, followed by an exceptionally strong and sustained growth of the older population. Violent crime, just like crime itself in general, is a "male prerogative": most of the violent crimes are committed by males (young males in the first place) against male victims. The

proportions are similar to those of the overall crime figures: 80 to 90% of the violent perpetrators are males (Virág et al., 2016).

3. Migration
   There are several reasons why immigrants and "natives" are involved in crime. However, there is not enough evidence related to these effects in European countries. Bianchi and his colleagues (2012) examined the relationship between migration and crime in the period between 1990 and 2003 in Italian provinces. When they analyzed data supplied by the police, they found that a 1-percent increase in the number of migrants led to a 0.1% increase in the number of registered crimes. Examining crime categories separately, they established that the correlation is the strongest in the case of crimes against property, including, in particular, robbery and theft. The next stage made the issue more complicated as variables derived from the other data of migrants entering Italy showed absolutely no causal relationship between migration and crime trends.
   Today it is often emphasized in forensic literature that it is not so evident that migration should affect crime. The migrant population is heterogeneous, ranging from applicants for asylum through sponsors to economic migrants. There may be a considerable difference between migrants depending on the country where they come from, the levels of their income, and their qualifications. Not to mention that statistics may be distorted by hate crimes against migrants or refugees, for example, in a prejudiced society or a society riled up by hate campaigns. It should also be noted that the term "migrant" is not easy to handle – due to lack of suitable integration strategies, the situation and the opportunities of second or third-generation migrants who were born as local citizens, and their limited paths of progress present a special challenge.
4. Unemployment rate
   According to the researchers who developed the economic model of crime (Becker, 1968; Ehrlich, 1973), job opportunities may have an impact on the individual's decision to get involved in criminal activities: if salary prospects do not look as good as benefits that can be earned by committing crimes, then those individuals will chose crime.
5. Frequency of prison sentences
   There are significant differences between the USA and Europe, and within Europe between the Eastern and the Western countries in regard to sentencing practices and incarceration rates, with the Central-Eastern-European countries having higher rates of incarceration. It is also a fact that the frequency of handing out prison sentences is increasing across Europe (Buonanno et al., 2011).

Forecasted characteristics of crime

Predictions made by politicians and professionals usually differ about the future trends of crime. Politicians tend to draw conclusions from a particularly serious or significant criminal act while professionals usually observe trends. For this reason, they seldom draw the same conclusions. The global decline of crime will continue in the coming years. Exceptions may

include a few acts of crime or crime categories that are given special attention by the politicians or the public (e.g. crimes against children, family violence, football hooliganism, etc.). In that regard the above mentioned changes in demographics and the markedly decreasing number of males aged 15 to 25, who commit crimes more often, according to the experience of the society, play a key role. Crimes against property will continue to involve desirable assets, although they will target electronic services, information, knowledge or personal identities more and more often. Acquisition of physical assets will rather serve for gaining access to various services, facilitating unauthorized logins, rather than obtaining the item itself. Crime is becoming more organized and even more internationalized.

Characteristics of *organized and internationally organized crime* can be summarized as follows:

- it can exploit innovations in transport and logistics enabling organized crime groups to commit crimes anonymously anytime and anywhere through the internet, without actual physical involvement;
- nanotechnology and robotics open up new markets and provide new tools for committing unlawful acts;
- big data and personal data that can be obtained through computer-based fraud allow for committing scams at a previously unimaginable scale;
- organized crime groups continue to increase their control of the recycling of electronic waste in Europe;
- increasing economic inequalities in Europe make citizens more tolerant to organized criminal activities and organized crime will be increasingly integrated into economically weak communities, thereby becoming a provider of job opportunities and services (see, for example, recruitment in organized crime, acts of usury and food usury in Eastern European countries);
- organized crime will continue to attempt to infiltrate business organizations dealing in natural resources, and act as an intermediary of these goods and resources in trade;
- internet-based crypto-currencies (e.g. bitcoin) will create more opportunities for criminal entrepreneurs presenting themselves as "freelancers" to adopt the business model of the provision of criminal services as there is no need for a well-established criminal infrastructure in order to e.g. launder money;
- organized crime keeps targeting the aging population, but it also serves them by supplying prohibited services and commodities, building a new market in this way by taking these opportunities (Europol, 2015).

Violent radicalization of organized crime and certain social classes can be observed, with the latter interacting with each other in the wider criminal economy. Tools developed for overcoming societal opposition often facilitate criminal acts. Some of the radicals or individual perpetrators use ideology to rationalize their criminal intents or the profit-oriented nature of their activities. The economic crisis and the progress that came to a dead stop provided these groups with great publicity and gave them an opportunity to recruit new members and maintain their coercive capacity.

Crime is being transformed while the decade-long decline continues

A fundamental issue in regard to forecasting crime is the period of predictability and the ability to identify the prevailing trends. Compared to international figures, crime rate in Hungary is not considered high: the number of crimes per 100.000 residents ranks the country in the middle among European states. Since the early 2000s the trend of declining crime has continued in Europe and in the United States. According to Eurostat data, the overall number of crimes registered in the EU-28 countries has been in decline since 2003. Figures of the Hungarian criminal statistics are also decreasing, and in the next years the decline in crime rates will probably continue. However, criminal statistics should only be used as a base of reference after a lot of refinement. It should be taken into account that criminal statistics exclude latent crimes such as family violence, child abuse, acts committed against minority groups, etc. Unfortunately there are no interviews with victims in Hungary that could be used to derive the figures characterizing latent crimes. Criminal infringements are also excluded from crime statistics. Overall a great flaw of Hungarian crime analysis and forecasting projects is that statistics indicating deviant behaviour are not compared to various social statistical data.

Figures of registered crimes in the developed countries started to decline a decade earlier. The decline of crime started in 1991 in the US, in 1995 in the United Kingdom, and in 2001 in France (The Economist, 2013). Based on Eurostat data it can be seen that in the 28 countries of the European Union the number of reported violent crimes dropped by 10% in the period between 2007 and 2012. A clear decline is observable in the data from the United States where FBI statistics *(Uniform Crime Reports)* in 2012 registered 37% fewer violent crimes compared to a period of two decades and 15% fewer than in 2007. There was another 4.4% drop in the number of violent crimes in 2013, with a proportional reduction in the number of homicide cases.[10]

The root cause of this phenomenon is debated by the professionals. According to Broadhurst, acts with catastrophic consequences for individuals, entreprises and governments have never been so easy to commit, even from the other side of the world (Broadhurst, 2006). In a given country, 80% of the cybercrimes are attacks initiated from abroad (Marsh–Rees, 2012).

Decline in crime is expected to continue, but at the same time the police will need to adapt itself to the constantly changing character of crime. Increase in cross-border crime is an already well-established trend among the new developments. UN data from 2012 show that international organized crime became a business valued at 870 billion dollars by 2009, which includes a wide variety of crimes ranging from money laundering to the various methods of smuggling (human, drug, arms, counterfeit products, wild animals and animal products, protected cultural items, etc.). Computer crimes are also on the rise as part of the international organized crime (Marsh–Rees, 2012). Crime is becoming more complex, affecting multiple jurisdictions anc causing even more harm in this way. In addition to conventional threats, new crimes and new threats, such as interpersonal violence

[10] Despite the decline, violent crime rates in the United States are still higher than in most of the European countries (Virág et al., 2016).

and theft emerge. This new challenge may significantly compromise the efficiency of police intervention.

Linear trends in Hungarian criminal activities

József Kó (2013) has made an attempt at predicting crime statistics related to the trends in Hungary. In a single year in 1989 the number of crimes reported to the authorities rose by 21.6% and in the next year the highest ever rise of 51.3% was recorded in the data. The change in the rate of increase was linked in time to the change of the political system, and for this reason Kó asks the question as to what extent this change of pace can be attributed to the change of the political system and if it is possible to establish the effect of the trend of increase that seemed to be universal at the time. After the millennium, domestic crime data showed a significantly reduced rate of change. Compared to the exceptionally high figures of the 1990s, there was a significant drop in crime, followed by a slight increase in the recent years. There are a number of options to perform a mathematical analysis of registered crime data in order to study future trends. Kó used a twenty-year forecast in the calculation of his models, and outlined three models: *1. a model of exponential increase, 2. a model based on a trend of a linear increase, and 3. an exponential model*

Kó stated the following (Kó, 2013):

"mathematically the most accurate fit was shown by an exponentially increasing curse as it has the highest R2 value (R2 = 0.84). Experience indicates, however, that such a dynamic growth is very unlikely. The model shows a good fit to the currently available data, but its implications would be difficult to interpret. As it stands, there are no apparent signs of a significant change in the society and crime cannot be separated from its social background factors. As a result, we consider the realization of this option unlikely.

Another model which is based on a linear trend of growth also shows a good fit (R2 = 0.8). There are several arguments that support the occurrence of this scenario. As we have already mentioned, data after the millennium seem to follow the previous trend of a slight linear increase that lasted until the end of the 1980s. The only problem here is the slope of the trend plot. Owing to the considerable difference in the level of data (figures around 200.000 in the 1980s are as high as 400.000 in the 2000s), the rate of increase of the trend is fairly steep. This model forecasts about 600.000 reported crimes in 2022. The probability that this model will come true is not negligible, however, there are factors that act against growth. One of these factors is the raising of the infraction limit to 50.000 forint. As a result of this amendment of the law, the number of registered crimes will decrease by 30 to 35 thousand in the next year, and this decline will continue to have an impact in the next few years.

A third exponential model predicts a much slower rate of increase, but in a mathematical sense, the fit is not so good in this case (R2 = 0.6). However, the improvement of the detective work carried out by the investigative authorities makes this model slightly more probable. In the recent years, the efficiency of detective work deteriorated. Growing crime came with a reduction in the number of identified perpetrators, however, this trend is hardly sustainable in the long run.

Based on experience gained so far, the number of known perpetrators will be correlated with the lower number of detected crimes in the next years. In our opinion, the actual data will be probably between the values predicted by Model 2 and Model 3, and around 2020, 450 to 500 thousand detected crimes are expected to be registered."

Future characteristics of crimes against property and violent crimes

According to official crime statistics, criminality against property has the largest share in registered crime, and its trend follows the changes in the overall crime rate. It is notable, however, that the forecasts differ because different factors influence the trends of certain crime categories. In the coming years, crime against property will split into two tiers: one of them includes conventional crimes that require physical contact, the other one contains new types of criminal acts against propery, using electronic devices.

There is no doubt that advanced technologies will transform the traditional methods of crime against property because acquiring electronic information (e.g. credit cards, personal financial information, etc.), PIN codes, mobile phone data, etc. require different modes of operation, and will significantly increase the damage caused. Conventional crimes against property will still be dominated by theft, taking into account, in particular, the ongoing technical development efforts and miniaturization which creates exceptionally favourable conditions for stealing small-sized but highly valuable items. Items that are attractive to both consumers and perpetrators are called *hot products* after *hot spots*. These items are identified with acronyms in the literature: *CRAVED* means *Concealable, Removable, Available, Valuable, Enjoyable, Disposable* (Sutton, 2010). The police in the US regularly warns the public that the list of stolen items is topped by electronic devices, and within the latter category, the number of mobile phone thefts shows the highest rate of growth (Kshetri, 2013). In the light of this fact, police leaders in the US and Canada keep encouraging legislators to make laws that make it mandatory to build anti-theft devices into certain items (Winkler, 2012). Copyrighted materials show the same dynamics; in their case, technical development is expected to focus on finding ways to reduce the possibility of illegal copying and use (Mueller et al., 2012). In the past 25 years, fraud became the "driving segment" of crime. The conventional and new forms of this offence (computer fraud, pyramid schemes, investment fraud, etc.) will continue to characterize crime in Hungary.

In addition to conventional crimes against property, IT devices and valuables that can be acquired by using them represent dominant segment. The use of computing devices will become a typical modus operandi in crimes against property that target the business sphere and private entrepreneurs. Information and entertainment are increasingly associated with services that can be accessed with electronic devices, which means that the technical devices itself will be a simple point of access to the service. Access to these services (music, films, games) will be targeted as part of the crimes against property.

Interest in and fear of violent crimes, including murder and sexual violence, are attributable in the first place to the severity and consequences of these acts, and not to their proportion within crime (Virág et al., 2016). Their proportion within crime in general has been in decline since the end of the eighties – in 1998 it was only 4.7% – and then it was stabilized around 8% by the end of the first decade of the 2000s. This proportion, however,

is misleading in regard to the actual trend of changes in violented crime. From the data of registered crimes it is clear that the number of known violent and disorderly acts has been increasing since 1989, exceeding 38.000 in 2010. In fifteen years, the number of crimes per 100.000 persons has doubled: In 1990, there were 196 crimes per 100.000 person, while in 2014, there were 369. Diminishing proportions were a result of the growth rate of violent crimes that lagged behind the skyrocketing overall crime rate that started at the time of the change of the political system. At the same time, while the number of all known acts of crime followed a declining trend after peaking in 1998, the rise of violent crime did not stop and it even continued in this period too.

Table 3

Number and proportion of violent and disorderly acts of crime (1970–2014)

Year	Total crimes	Violent and disorderly offences	Proportion (%)	Violent and disorderly offences/100.000 citizens
1970	122,289	16,464	13.5	160
1971	123,147	15,947	12.9	154
1972	125,399	14,566	11.6	140
1973	125,388	13,581	10.8	130
1974	111,825	13,154	11.8	126
1975	120,889	14,049	11.6	134
1976	129,424	14,795	11.4	140
1977	123,623	14,016	11.3	132
1978	126,907	13,131	10.3	123
1979	125,267	12,714	10.1	119
1980	130,470	13,196	10.1	123
1981	134,914	14,565	10.8	136
1982	139,795	14,290	10.2	133
1983	151,505	16,743	11.1	156
1984	157,036	18,099	11.5	169
1985	165,816	17,598	10.6	165
1986	182,867	18,967	10.4	178
1987	188,397	17,791	9.4	168
1988	185,344	16,283	8.8	154
1989	225,393	17,043	7.6	161
1990	341,061	20,383	6	196
1991	440,370	23,078	5.2	223
1992	447,222	24,503	5.5	237
1993	400,935	24,574	6.1	238
1994	389,451	26,035	6.7	253

1995	502,036	25,731	5.1	251
1996	466,050	24,674	5.3	242
1997	514,403	26,987	5.2	265
1998	600,621	28,414	4.7	280
1999	505,716	28,277	5.6	280
2000	450,673	29,144	6.5	290
2001	465,694	30,821	6.6	302
2002	420,782	31,214	7.4	307
2003	413,343	31,486	7.6	310
2004	418,883	33,366	8	330
2005	436,522	32,760	7.5	324
2006	425,941	29,728	7	295
2007	426,914	29,645	6.9	295
2008	408,407	33,035	8.1	329
2009	394,034	32,048	8.1	319
2010	447,185	38,445	8.6	384
2011	451,371	37,201	8.2	373
2012	472,236	37,368	7.9	375
2013	377,829	36,307	9.6	366
2014	329,575	36,413	11	369

Source: ENyÜBS

In mass criminality in Hungary there are still no threatening new effects that would concern society. A further reduction in registered crimes can be expected, and the current situation in which interpersonal acts (violent crimes and crimes against property) dominate the trends of known crimes will not change until the 2020s.

Changing trends in crime

As mentioned above, computers and the Internet change the characteristics of crime against property profoundly. Obviously computerization also changes the distribution of perpetrators as only criminals who are knowledgeable about software can benefit from the new opportunities. For them, even committing conventional crimes against property (e.g. fraud) offers greater returns. However, organized crime groups attack service providers and often they use organized methods to collect data required for their criminal activities. The popularity of electronic transfers and the spreading of e-commerce can make these systems particularly vulnerable to such intrusions.

Committing highly profitable crimes (e.g. illegal waste dumps, trafficking in arms and hazardous chemical substances, human smuggling, human trafficking) requires more intensive organization efforts. Corporate crime that used to be the arena of corporate em-

ployees is becoming more organized and to an ever greater extent it is complemented by a network of external connections. In particular, the bank sector creates favourable conditions for organized offences. Crime in the future will be less restricted by borders and typically it will become transnational. The best prepared criminal groups satisfy demand appearing in the world market, exploiting the flaws and deficiencies of the regulatory frameworks of nation states and the limited jurisdiction of their regulatory powers.

A special segment of crime is the criminal acts committed by the "powers that be". The crimes of people who are privileged either politically or economically – the so-called white collar crime – is rooted in the economy and it is closely related to the objective of gaining more social and political power. According to the findings of research projects, white collar crime can amount to 10% of all crimes against property and 40% of economic crimes (Kránitz, 1995). Wealth is concentrated rapidly over the world. In the upper echelons of the society, the limitless growth of revenues and the extreme concentration of wealth pose a real threat to the meritocratic values and social justice of democratic societies. Globalization clearly increases inequalities in wealth and in social structures it puts millions at a disadvantage. The direct correlation between this effect and criminality has been known for a long time as structural inequalities foreshadow the potential spreading of crime and violence (Blau–Blau, 1982, quoted by: Irk, 2013).

Piketty (2015) used data from the past 300 years to study inequalities inherent in the workings of capitalism. He confirmed that return on equity is always higher than the rate of economic growth. Before the 19th century, return on equity was around 4 or 5%, while the rate of growth remained below 1%, and probably the same situation will occur in the 21st century: return of equity will be 4 or 5% again, while the rate of growth calculated for the long term will barely exceed 1.5%. This mechanism puts wealthy social classes that can accumulate capital in a privileges position. Evaluation of economic crime rates is still almost impossible on the basis of official criminal statistics, in part because of the high latency, in part due to inconsistent regulations, and in part due to difficulties of obtaining proof. Describing corruption closely related to economic activities poses a similar challenge and so does forecasting its future trends.

In the case of first and second-generation information technology crimes we can simply remove the internet from the equation – despite this move the crime remains feasible, however, different channels will have to be used to obtain the desired information or to perform organization. In contrast, modern age third-generation *sui generis* information technology crimes would not exist without the internet (Wall, 2008; quoted by: Parti–Kiss, 2016). As we have already discussed, Internet is a technology that, in part, facilitates the commission of conventional crimes and, in part, creates opportunities for finding new ways to commit crimes. Sexual harassment or blackmail committed using an Internet based device can cause exceptionally severe financial and moral damages to the victim. In many cases, the perpetrator has no idea that whatever is uploaded to the Internet cannot be deleted ever. In the future, the young generation's lack of moral and ethical preparedness may significantly increase damages caused by acts of crime on the Internet. Victimology studies confirm that victims can play a role in triggering certain crimes. It is especially true for participation in online community spaces where members share their personal data themselves. It is expected that possession of devices representing an ever increasing level of technology without any actual knowledge of their operation will contribute to an increase in IT crime rates.

Drug problems and crime were linked to each other in the 1960s. In Hungary consumption of drugs appeared in the 1970s, first as the consumption of a combination of various medicines and spirits, followed by the use of cheap replacements for classical hallucinogens. Technical development also left its mark on the drug scene; increasingly dangerous new psychoactive substances were placed on the market. To so-called designer drugs are untested substances of unknown composition and mode of action – often the dealer does not know what it is they sell. Synthetic drugs such as "herbal" or "bioweed" which, despite what its name suggests, is synthesized in drug laboratories and mixed with plant scraps are becoming popular. In a single year the proportion of those who have tried the synthetic drug called "herbal" at least once rose by 5% in Hungary, according to the most recent data of Global Drug Survey (GDS) (Winstock et al., 2016). Professionals argue that use of designer drugs should be considered so-called "poverty drug use". An ever increasing number of people from the most marginalized classes turn to these substances that are cheaper than alcohol. Synthetic weed is frequently ordered on the Internet. As Miklós Lévay and Ildikó Ritter point out (Lévay–Ritter, 2016):

"[The data] *indicate that all phenomena associated with drug problems that are present in most of the European countries can also be found in Hungary. Compared to the drug situation in the more developed European countries, however, the key difference is that (although it is difficult to estimate how wide spread the phenomenon is) in all likelihood only a small part of the Hungarian population is involved in the drug problem. Another difference is that in Hungary the drug situation has less influence on crime rates and public security compared to what is experienced in the majority of the Western-European states.* […] *2013 was the first year when the proportion of seized new synthetic drugs exceeded the proportion of seized »classical« drugs. The seized amounts of herbal substances containing synthetic cannabinoids have been increased since 2010, but only exceeded the seized amounts of marijuana in 2013. The increasing frequency of encountering new drugs and the partial loss of market share of classical drugs (e.g. marijuana, heroin, cocaine, amphetamine) indicate the reorganization of the drug market."*

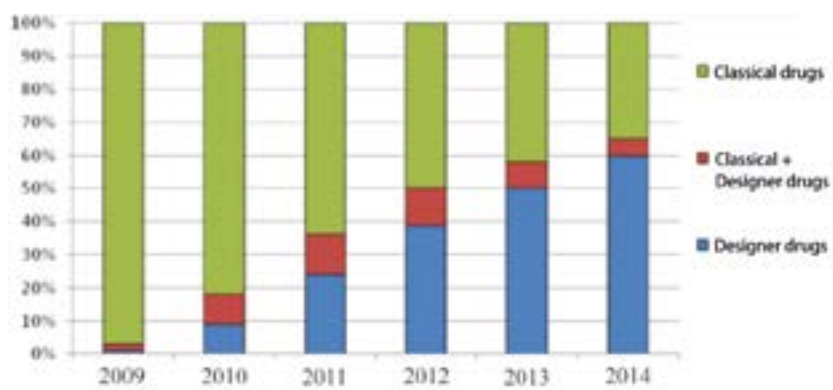

Figure 1

Percentages of the number of drug seizures

Source: Tamás Csesztregi, http://444.hu/2015/06/11/a-herbal-felzabalta-magyarorszagot/

In the age of globalization, criminality also operates internationally. Unrestricted movement across borders, cross-border crime, and organization of criminal networks forces criminal justice to change its paradigms (Castells, 2007). Trends in terrorism and in domestic and international organized crime are also noteworthy. The fight against crime is becoming globalized, even though it is undeniable that criminal justice works best within the framework of nation states. Ever more often the police encounters new forms of crime and/or threatening consequences of social/environmental changes that it is not prepared to handle and which require a complex and collaborative response.

Andreas and Nadelmann (2006) considers two trends as determinants which influence the complexity of the international system of crime control. The first one is that law enforcement and national security organizations act together in the fight against terrorism; the second one is that a transatlantic security community has been formed in which cooperation is furthered by associations of law enforcement agencies and a network of relationships, and which is also supported by a system of intensifying transnational police cooperation and agreements.

Future criminals and victims

In the future households, persons, business ventures, and governmental and local governmental institutions will fall victim to crime. Demographic makeup of the population will also play a role in this case. Forecasts indicate that the population of people older than 60 years will increase significantly. Aging of the population has been clearly noticeable in the data for some time now, and this steady trend will continue in the next 20 years. The population will remain the target of crimes against property, especially because the development of high-value but highly miniaturized technical devices continues. According to data from the year 2014, victims of crimes against property are typically adults (65%) and elderly people (24%). The exposure of the elderly is signified by the fact that as perpetrators their involvement in crime against property is only 3%, while as victims it is close to 25% (Rosta, 2016). Among perpetrators, the dominant age group is still the risk taking 15 to 25-year olds who are typically divided into two groups: those who usually commit conventional crimes and those who resort to more advanced methods and have higher level skills in the field of cybercrime.

The first group is not so different from the current category of conventional young criminals: their members tend to belong to the lower classes of the society and are embedded in an environment burdened with a lot of dysfunctions, they did not perform too well in school and got involved on several occasions with child protection or law enforcement services. Furthermore, this group is responsible for committing simple crimes against property, breaking and entering or thefts from cars. The emergence of a new knowledge-based economy and the rise of new technologies have a disproportionate impact on disadvantaged classes of the society, and groups who lag behind in the process of acquiring specific types of knowledge get excluded from the more profitable categories of crime.

Groups of skilled young middle-class people with technological savvy can put this knowledge to use by committing unlawful acts. The average citizen is getting better at using technical devices but less and less familiar with their principles of operation. This may

create an excellent situation for malicious and well-prepared perpetrators. As a result, the exposure of the elderly age groups to risks is expected to increase and so is the frequency of scams committed against older people. Demographic trends show that the risk of the elderly population becoming victimized will rise in the next 10 to 15 years.

Effects of crime in the future

Financial and other consequences of crime are not negligible even today. Damage caused by crime in 1989 was 3.9 million forints, and the highest amount of damage, 153.7 billion forints, was recorded in 2003 (Rosta, 2016). Practical experience shows that only a fraction of the damage is recovered. Crime against property includes not only damage involving personal effects and property, but affects a situation regulated in an already established way and the existing system of social relations (Korinek, 2010: 140.). In order to protect the mental hygiene of the society, it is important to notice that certain forms of crime against property (e.g. reaping of produce, theft of livestock, etc.) cause serious damage to solidarity between individuals and social groups, because not only a valuable asset gets stolen but also the product of a serious investment of labour (Kerezsi, 2007).

The changing management system

Trends in crime can be predicted on the basis of economic and social changes and the relationship between the players of the security and protection sectors. The increasingly multicultural character of terrorism and population, the changes in the mix of age groups, and other effects of technical progress and globalization will also influence the characteristics of crime and the system of crime control. In regard to the complex system of factors affecting the phenomenon of crime, the question is rather what elements on the list of priorities should be taken into account.

Cutting edge technology and crime control

At the end of the 20th century and the start of the 21st century, high-end technology made its debut in crime control. The change in the global political situation made it necessary to find a "target market" that needs the advances in high-end technology and can use them too. Nowadays, crime control is an excellent playground for high-end development. First, due to technological upgrades (e.g. the roll-out of geographic information systems or GIS) that can be used to investigate crime, second, through the development and deployment of new devices needed in the fight against terrorism that require further development themselves (iris diagnostics, Echelon system), and third, the other areas of criminal justice (e.g. enforcement of sanctions) and crime prevention can also serve as a target market (Kerezsi, 2009). This is how new generations of mobile phones and personal surveillance devices suitable for satellite tracking are added to the assets of the electronic personal tracking

systems. High-end technology upgrades are particularly useful in the security industry and in property protection.

The quick spreading of security cameras is one of the visible signs of technical development. The constantly upgraded versions of these devices are expected to monitor public and private spaces in ever greater numbers in the future. The system of security cameras is an investment that offers a good return indeed, but leaves the questions unanswered whether or not these devices are suitable for improving security in an era of transition and whether by using them the requirements of reducing crime and those of public security and human rights can be met through their use (Sheldon, 2011).

Security provided law enforcement agencies versus private security

The existence of the private security sector is the proof that citizens are not satisfied with the level of security guaranteed by the state, and for this reason they take security in their own hands, taking back a right that they had delegated to the state in the past. The private security sector saw a significant growth in North-America and in Europe in the middle of the 20th century, but exponential growth was observed in the past three decades. By the end of 1996 there were almost 600 hundred employees working in the security sector in the then-15 member states of the European Union. Private security was the second source of protection in European countries, but it was already ranked first in Canada, the USA, and Australia. But the absolute champion of the security industry is South-Africa (Waard, 1999). For example, between 1991 and 2001 in Canada the private security and private investigation sector grew by 69% (Brown, 2006: 2.). Beyond conventional private security activities (such as night-time guard service or private investigation), the Canadian private security sector assumed roles such as the deportation and guarding of migrants (Pratt, 2005), surveillance of passengers at airports (Lippert–O'Connor, 2003), and investigation of certain economic crimes (Williams, 2005). Hungarian private security companies are also expected to start moving in that direction, but for now the beefed up staff numbers at the police and other law enforcement bodies seem to satisfy the increased demand for security.

The migration of professionals whose training was financed by public funds from the public security service sector to the private sector became a common phenomenon and so did the proliferation of private security services. At the end of the 1960s in the USA almost twice the number of professional police officers were active than the number of employees in the private security services sector, but in the past decades the trend was clearly reversed (Sklansky, 2006). Today, employees of private security companies guard various industrial facilities, financial institutions, office buildings, transports, sports facilities, shopping centres, and even entire shopping and residential districts. An average middle-class US citizens will more often encounter a security guard than a police officer. For example, according to official data, in 2004 in the USA there were 43 thousand (contracted and full-time) private investigator jobs while the number of security guards was slightly more than 1 million compared to 842 thousand police jobs, including detective jobs too.

Today the private sector is a dominant part of the security industry. Based on data from the Hungarian National Police (ORFK), there were 127 thousand valid bodyguard and property guard identity cards in 2015 in Hungary. The actual number of active employees

is made up of 75 thousand bodyguard and property guards and 1600 private investigators, with about 3000 companies involved in private security (Christián, 2015). The number of persons working as security guards is one and the half time that of the number of professional police officers, which is 48 thousand currently.

A criticism aimed at private service providers gaining ground in the field of law enforcement claims that they cause a shortage of labour in the public sphere, and as a result the tax money spent on their training is wasted. The most frequently expressed criticism claims that even though they attend to their duties more efficiently than the state, but the scope of their services is obviously limited to what their customers motivated by business considerations expect. By protecting metropolitan locations, shopping centres, and residential areas, the player of the Hungarian security industry provide services to the favoured classes of the society that are willing and able to pay for them. We should not forget, however, the not so favoured groups of the society. They are not users of these services, rather they constitute the target group that must be monitored by security companies, most often on behalf of local governments. We could also refer to the order placed with the security company that patrols the "Avas" residential district in Miskolc and the establishment of "guarded" zones in the city of Budapest. Another example involves a local government mandate given to a security company after the closure of apartments vacated at the Dzsumbuj district due to constant evictions, to prevent the return of unlawful occupants. This means that security guards do not protect only the members of the favoured or privileged classes, but they also monitor the people who belong to disadvantaged social groups. This is how poverty turns into a state of helplessness (Kerezsi, 2013).

Alienation of law enforcement bodies

In European countries outsourcing, privatization and subcontracting of security-related operations to other public, private or profit-oriented organizations working in the field of security is becoming typical. In our domestic system, the reallocation of the rules of jurisdiction to various law enforcement agencies or the transfer of certain powers to local governmental law enforcement agencies and the civil guard is a fact. In this process, plurality of police work will be more evident, similar to the strengthening of the professional model.

In our opinion, there is a good chance that in the next decade a professional police model that uses technical equipment in a wide variety of applications and adapts itself more readily to increasingly militant expectations will be reinforced. This process will increase control over the community and maybe get rid of the ideological undertones of a community police that had been so difficult to interpret. This represents a return to a narrower interpretation of professional police activities, which, in turn, means increased intrusion into the citizens' lives, transitioning from surveillance to a wider lifestyle-control. Regardless of how much we disapprove of it, it is forecasted that this trend will gain momentum. At the same time we also need to point out that the approach which regards the police as an organization above/outside the social structures is incorrect. There is a great need for sociology-based studies of the operation, composition and practices of the police. We do not think that defining the social mission of the police would be "outdated" because the police is not just a law enforcement agency. Its community tasks involve the provision of

security and peace and the promotion of crime-prevention measures, no matter how little the current social conditions support this approach.

This topic is related to the alienation of law enforcement from certain groups of the society. For the social workers and teachers involved, the obligation to report the suspicion of terrorism presents a serious dilemma in communities where mutual trust constitutes the foundation of work. Working in minority communities and migrants coming from a different culture poses extra challenges to the professionals. Politics may reject multiculturalism, but it remains the reality for society. Adopting sensitive and non-discriminative rules of procedure is of utmost importance. In regard to the efficiency (and legality) of ethnic profiling, the risk of alienating the communities of minorities is a frequently used argument because it is an important consideration in crime prevention and law enforcement (including conventional law enforcement and national security policy). A community law enforcement model that has been widely recognized for several decades is based on the recognition of fact that local police duties (or national security tasks) can be more efficiently performed with the active cooperation of the population; the police organization functions correctly if the community regards it not as a hostile, unjust and oppressive power, but as a protector of peaceful law-abiding people where the real enemy is the criminal.

Institutional discrimination

Discrimination and exclusion implemented and maintained in cooperation with law enforcement is an extremely complex phenomenon. For example, structural discrimination (Pap, 2015) is not a legal concept but a notion used in social sciences, which refers to a universal systemic form of exclusion that goes beyond the operation of the individual, sometimes broadly interpreted institutions. It draws the attention to the fact that exclusion became a permanent part of the various forms of social contact, and may be based on recurring habits and behaviour patterns that take the form of attitudes, norms, values and choices of values, and causes certain groups to be put at a systemic disadvantage. In addition to not requiring any detectable individual exclusionary behaviour patterns or intents, it cannot be detected in the formal rules regulating the practices of certain social institutions.

In the USA, "three-strike" laws that specifically disadvantage African-Americans or the peculiar codification practices of drug laws are described as institutionalized discrimination. In regard to its purport, the concept of institutional discrimination means more or less what the Hungarian ombudsman for minority rights wrote in regard to the *National Strategy for Social Inclusion and Roma Integration*: "Institutional discrimination is not necessarily a result of an intentionally discriminative procedure or mindset, but from an institutional mode of operation and institutional culture that ignores the situation and considerations of those members of the society whose ability to protect their interests is compromized. Institutional operation […] without suitable means may also augment institutional discrimination."[11]

[11] Position of the Parliamentary Commissioner for the Rights of National and Ethnic Minorities concerning the draft document entitled National Strategy for Social Inclusion and Roma Integration. www.kisebbsegiombudsman.hu/hir-702-nemzeti-es-etnikai-kisebbsegi-jogok.html

We can find examples of institutional discrimination in the Hungarian practices too. The Commissioner for Fundamental Rights and the deputy commissioner for the protection of the rights of minorities living in Hungary initiated a comprehensive joint investigation into the official control practices of the law enforcement agencies of the local government of the town Miskolc. The report found that[12] the Law Enforcement Agency performed control operations in cooperation with different local government agencies[13] simultaneously at scheduled dates and times and along pre-selected roads, in a joint and combined manner, often in the form of a massive shakedown – without any specific legal authority – in segregated residential districts of Miskolc.

Systemic under-classification of hate crimes resulting in an investigation conducted, and in charges being laid, on the basis of different and less severe facts[14] or if police officers and judges talk to marginalized persons, defendants or witnesses in interrogation rooms or at courts in an impolite or condescending manner can also be regarded as institutionalized discrimination (Stummer–Stummer, 2014).

Roma policy in law enforcement

Forecasts of public security should also address Roma policies. We do not believe that the situation in which migrant communities from different cultural background will avoid Hungary in the long run. For this reason, the political and public policy approach that currently prescribed law enforcement practices for dealing with the only major minority is particularly concerning (Pap, 2015). The Hungarian state defines the Roma community in an essentialist way that could be characterized by the terms "neo-racism" and "culturalism". The documents that describe ethnicity based conflicts do not refer to actual ethnical conflicts but conflicts that have been ethnicized by this approach, while they also ethnicize the approach based on the "culture of poverty" (Szuhay, 1999) which is problematic in itself (Korinek, 2006; Kerezsi et al., 2010). This is caused, among other things, by the fact that the legislator and the government chose to adopt documents and rhetoric created in a migration-based

[12] See the joint comprehensive investigation of the Commissioner for Fundamental Rights and the Deputy Parliamentary Commissioner for the Rights of National and Ethnic Minorities concerning the joint control practices coordinated by the Law Enforcement Agency of the Local Government of Miskolc, the local housing regulation, and other measures affecting access to housing, adopted by the Local Government of Miskolc, and amendments to local regulations of settlements in the neighbourhood of Miskolc; Joint Report no. AJB-1474/2014.

[13] The investigation was joined by the Family Assistance and Child Welfare Service (which is not authorized to conduct official investigations pursuant to the Act XXXI of 1997 on the Protection of Children and the Administration of Guardianship); organizational units of the office of the mayor (e.g. head of the healthcare and social department, chairman of the healthcare and social committee, spokesperson, public security rapporteur); the Police Headquarters of Miskolc; ÉMÁSZ; District Public Health Institution of the District Office of Miskolc; District Guardianship Office of the District Office of Miskolc; Digi Ltd.; Miskolci Városgazda Városgazdálkodási Kht.; MIVÍZ Ltd. and MIHŐ Ltd.

[14] According to the Workgroup Against Hate Crimes, perpetrators of violent crimes against members of groups which are the most vulnerable to hate crimes, including the Roma people, members of LGBTQ communities, refugees, migrants, Jews and homeless people are often either not indicted at all or they are charged with crimes other than hate crimes in Hungary. www.gyuloletellen.hu/aktualitasok/tasz-allaspont-gyulolet-buncselekmenyekrol

Western-European multicultural environment that differs from domestic conditions, which proved to be inadequate when applied to the Hungarian Roma community. In part, it is due to an incoherent and inconsistent representation of the Hungarian Roma community in public law, as minority self-governments defined as the repository of cultural identity were channelled into public policy institutions for social integration which also covers the area of law enforcement. Public policy documents regard conflicts as cultural, and for this reason minority self-governments are the institutional partners for law enforcement authorities in education, crime prevention, law enforcement and penitentiary matters.[15]

Local crime prevention

Changes are expected to take place in local crime prevention: the instruments available to crime prevention will rely increasingly on suppressive techniques and on the control and identification of dangerous locations and groups of persons. Security appears to be emphasized as an organizing principle in local services. Local problems will be evaluated more and more as law enforcement and security issues. However, using arguments that are dominated by claims about lack of security is not the best way to build a balanced community. The police must not be an active part of the conditions in which the community prospers, but we must realize that this is just a minor element of a wider framework that sustains communities that are capable of progressing.

New generation of police officers career at the police

Changes are taking place in the organizational and operational culture of the police. The new generation of police officers have different views about police activities. Today, young people are more prepared, more ambitious, and more impatient to achieve results, and they change jobs and professions more quickly and more frequently during their careers. They have a different attitude towards the hierarchical structure of the organization and these new characteristics must be recognized by the organization too. Due to the phasing out of the early retirement option, it is becoming a tempting alternative for the personnel to switch not after the end of their formal law enforcement career but earlier, to start a career in private security by leaving the police.

Lack of understanding and/or regulating the Hungarian crime control system

There is no doubt that terrorism, an increasingly multicultural population, mass migration, changes in the distribution of the population among age groups, the technological revolution

[15] Summary Report of the Thematic Workgroup for Roma Matters operating within the framework of the Human Rights Workgroup, issued in 2015 about 478 agreements concluded in 2015 between the police and various Roma local governments. 11.

as well as other effects of globalization will strongly influence the system of crime control in the next two or three decades. By now the causes of crime and the possibilities of influencing it are far removed from the competences of conventional justice, however it does not mean that criminal justice may give up its values that manifest themselves in the due process.

In the following points we summarized deficiencies in research, knowledge and regulation that should be eliminated to reinforce the system of crime control:

- A lot of information related to public security is missing from criminal statistics. Such information include infringements and data related to petty crimes. Criminologists have been arguing for the necessity of researching latent crimes for many years.
- Data about victims, that is, national and regular victimology studies are painfully lacking. This kind of information gather is not superfluous even if there are refined and accurate official criminal statistical data. In the possession of such data, it is possible to verify trends that appear in criminal statistics, but these data can also verify, in part, the functioning of the crime control system (e.g. reported but unregistered cases).
- There are no investigations regarding the expenses of the judicial proceedings. Without such data, we can win a Pyrrhic victory as the outlays intended to curb crime may be higher than the damage caused by crime itself. Such investigations were carried out in the past years as rare exceptions (Váradi–Márk, 2015; Kerezsi et al., 2011; Győrfi–Váradi, 2016). Lack of studies concerning the effectiveness of justice is a similar problem (Hack, 2008; Farkas, 2002).

In the fight against crime, politicians seldom look beyond the exercising of rights and the punishment, while several other targeted policy measures could also be effective. There is a lot of evidence that better qualifications, higher standards in education will definitely reduce crime rates. In addition, extensive research in law enforcement should be conducted as the global spreading of populist rhetoric is built on the notions of and the public policy dialogue about threat, security, and public order without reflection, criticism or reliance on scientific analyses and explanations.

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Klára Tóthné Szita

The Green Development as a New Sustainability Model – Advantages and Critical Issues of Resource Management and Environmental Protection

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Abstract

The ongoing transformation of global prospects for the future of humanity is burdened with a number of uncertainties that apply to Hungary as well. The challenge is to identify factors influencing the future, to examine and analyze the driving forces behind international trends and their consequences in Hungary. On the one hand this paper provides a brief overview of the literature dealing with green economy focusing on its background and terminology, the possibilities of measuring green growth and the current situation of green economy. On the other hand, the study seeks to answer the following questions: how to observe the signs of the present and future implementation of the green economy in Hungary; how rotating economy represents and alternative in the transition towards sustainability; what are the benefits and risks of resource management in the new sustainability model; what social, economic and environmental challenges are expected in the green development of various scenarios in the coming decades, and what are the most prominent security issues?

The above questions are answered with the help of research conducted by the author, statistical data analysis, national and international scientific literature. Because the problem is extremely complex, the study, without intending to be exhaustive, focuses on issues that are more prominent in the future.

Keywords: green economy, circular economy, performance of green growth, sustainability, risk, benefit

Green economy: concept and characteristics

A wide variety of definitions have been worked out for the term “green economy” since 1995, however, none of them has gained universal acceptance yet. The concept got to be increasingly widely adopted in the wake of the financial and economic crisis that hit the world in 2008, as a solution that may be a way out of the crisis, under the aegis of which the UN

can assist and support countries in a more consistently harmonized way (EMG/SOM.15/02). The transition towards green economy is also promoted and assisted by the World Bank and the OECD. It is referred to by Opschoor (1995) as a sustainability model, while the UNEP (*United Nations Environment Programme*) identifies it with zero CO_2 emission and the coverage of the total energy requirement from renewable sources. Sach (2010) argues that it is nothing like a free lunch, but it is a lot better and cheaper than doing nothing and watching the environment being destroyed. The achievements of green economy contribute to human welfare and social equity, while environmental risks and ecological scarcity are decreasing considerably (Burkart, 2009). A green economy is environmentally sustainable, socially equitable and promotes economic, environmental and social welfare (Bapna–Talberth, 2011; Danaher, 2012). Gouvea et al. (2012) claim that green economy is the appearance of green resources, green competitiveness and green products in the global economy where green entrepreneurs and green jobs create a CO_2-neutral economy. Carfì and Schilirò (2012) worked out a green model links it with the climate change policy because it involves low CO_2-emission technologies involving competitive *win-win* solutions. Fedrigo (2012) proposed a schematic model in which a transition is required first towards a green economy by removing the unsustainable trading system from the conventional business model (BAU) and an active environmental management is exercised, involving risk analysis and proactive natural capital investment. Eco-efficient solutions may enable environmental sustainability and, by resorting to innovation and changing demands a radical *decoupling* may be achieved, together with an acceptable green economy, where the economy's use of resources is accompanied by decreasing environmental impacts. Innovation has a key role to play in such transition, with a positive impact on job creation as well.

The relatively new and increasingly fashionable concept of circular economy lays emphasis on waste management, waste prevention and resource-efficiency; but is not the same as what is referred to as green economy. It is characterized by closing processes instead of the continued application of open circuit models; it reduces environmental pollution by recovering valuable materials from waste, by reuse or recycling of products, saving materials and resources at the same time. In addition to the above, green economy also focuses on well-being and on the protection of the ecosystem (EEA, 2015). At present the Union's green economy facilitating programmes support the efficiency use of resources, along with eco-efficiency, sustainable production and consumption, up-to-date waste management, waste prevention and the management of aquatic resources.

Green economy after of Rio+20

Particular emphasis was laid on expectations concerning the green economy during the preparations for the Rio+20 conference. It was envisaged as practically the only solution, promising certain success, for a way out of the crisis, provided that a global governance can be developed on the basis of a global consensus, under the aegis of a green global economy, which will also enable progress towards the sustainability goals (Biermann et al., 2012). By 2012 it was clear that despite progress having been made, the objectives that had been set beforehand, could not be achieved. The conference revealed a deepening antagonism between the interests of the North and the South and no consensus was reached. No matter

how the priority topics of the conference included sustainability and green economy, energy, sustainable cities, food safety, agriculture, natural waters and oceans; no compromise could be reached in terms of truly critical issues. Consequently, the conference was closed without a breakthrough; indeed, one may safely say that it was a venue of yet another failure. It was expressed in the closing document that the post-2015 goals and the available instruments towards them should be reconsidered once again. It was confirmed that the achievement of sustainability could be promoted through the 17 sustainable development goals and the further 169 targets if adequate political will exists. The 17 sustainable development goals are as follows:

1. End poverty in all its forms everywhere.
2. End hunger, achieve food security and improved nutrition, and promote sustainable agriculture.
3. Ensure healthy lives and promote well-being for all at all ages.
4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
5. Achieve gender equality and empower all women and girls.
6. Ensure availability and sustainable management of water and sanitation for all.
7. Ensure access to affordable, reliable, sustainable and modern energy for all.
8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
9. Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation.
10. Reduce income inequality within and among countries.
11. Make cities and human settlements inclusive, safe, resilient, and sustainable.
12. Ensure sustainable consumption and production patterns.
13. Take urgent action to combat climate change and its impacts by regulating emissions and promoting developments in renewable energy.
14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development.
15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.
16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.
17. Strengthen the means of implementation and revitalize the global partnership for sustainable development.[1]

"The green economy has become one of the most important strategic concepts, which is considered to play a just as important role in the accomplishment of sustainable development, as being a possible alternative for a way out of the neoliberal economic crisis. The very essence of green growth is that it can ensure development and competitiveness, while at the same time it enables the retaining and future use of resources and preserving the

[1] www.unis.unvienna.org/unis/hu/topics/sustainable_development_goals.html

environment's biocapacity. All these are achieved with the help of new sources of growth where the improvement of productivity is provided for by efficient resource utilization, the potentials lying in innovation are exploited and, by selling green products and technologies new markets are conquered, strengthening confidence and stability" (Tóthné Szita, 2013: 3.). At the same time, the equivalence of green economy with sustainability is called into question by many, because green economy focuses solely on the economic benefits and does not deal with preserving biocapacity and well-being, even if the three pillars underlying sustainability continue to be relied on.

The benefits of the green economy appear primarily at a micro and a mezzo (sectoral) level, while the macro-economic aspects of the transition into a green economy are also important, but much less extensively discussed. At a macro level there are four specific fields that need to be discussed in particular, where impacts may be encountered. On the other hand the *impacts* of today's decisions on the *welfare of the future generation*, on the other hand, the impact generated by aggregated demand and supply appearing as a consequence of *environmental investments*, together with its advantages and contradictions. Thirdly, there is the future macro-economic impact of *structural changes in production and consumption.* Finally, the impacts stemming from debates pertaining to the financing of the green economy, concerning the extent and scope of support to be given to the developing world's green transition (Ocampo, 2013).

The question is, if green economy has so many advantages and benefits, whether it is possible to pinpoint a particular country whose practices in the development of a green economy are definitely worth following. Is it possible to build up a green global economy, or is it just a dream? Approaching the issue from multiple angles may help finding an answer to the question.

One may start by analyzing statistics on green growth in the global economy, for example by the calculation based on the IPAT formula worked out by Chertow (2001), where impact = population x affluence (consumption/capita) x technology (impact/consumption). Seri's world atlas may also be used (Seri, 2012). Global environmental pollution has increased, the total global population has exceeded 7 billion and ecosystem services have been diminishing. By 2050 the total population of the world will be over 9 billion and ecosystem services will continue to shrink. The total global material use has doubled during the past 30 years. Mankind is still increasingly dependent on non-renewable materials (including fossil fuels, metals and minerals). The world's equilibrium has been upset: more than three quarters of the total global resource use is accounted for by 18 countries, while the 100 least consuming countries use a mere 1.5%. An average Austrian citizen consumes 10.2 tonnes of resources each year, while the corresponding figure is significantly lower in most other countries. Man has never traded so much in resources at a global level as today, and Europe will have to compete increasingly fiercely for raw materials in the future (including, primarily, fossil fuels and metals). Europe's high living standards are enabled by raw materials brought in from other continents, with all of its negative impacts on the regions concerned. Among the global regions Europe depends most heavily upon resource imports (Seri, 2012). The current state of developments – particularly: urban development – all over the world is anything but promising, as it moving not in a direction towards sustainable planning. Consumption is not diminishing at a satisfactory rate either. If the goal is to

achieve zero emission through changing consumption, the amount of resources used must be reduced first, and it must be accompanied by efficiency improvements (Jackson, 2013).

Green economy development programmes are to be found all over the world, including the European Union and Hungary. The Union promotes green economy objectives, however, implementation requires a thorough revision of the entire system of its economy because no long term goals can be accomplished by efficiency improvements alone (EEA, 2014). It is true that major progress has been made since 1990 in cutting CO_2-emissions and reducing the consumption of fossil and other resources, the waste output has decreased and the ratio of recovery has increased, however, in absolute terms the amounts of resources used are still too large, and levels of hazardous emissions are still too high. Moreover, the Union's environmental policy goals are still not always in line with ecosystem resilience or with the aim of mitigating people's health and welfare risks. It is enough just to take a look at statistics showing the health issues caused by pollution, primarily as regards urban populations. A total of 430,000 people died in 2011 as a consequence of airborne particulate matter pollution and noise pollution, while some 10,000 deaths occur each year as a result of coronary artery disorders and stroke. For this reason, more attention need to be paid in decision making to the environmental carrying capacity and risks, uncertainties, benefits and costs must be assessed and evaluated together (EEA, 2016).

To enable structural changes required for creating a green economy environmental and climate policies must be more closely integrated and more effectively promoted for accomplishing long term goals. These provide a comprehensive framework for creating a new economic model in which focus is on energy efficiency, energy conservation and the use of renewable resources and own resources (Széchenyi 2020; UNEP, 2011).

Demand grew stronger after Rio+20 for discussing certain critical areas at international conferences where the issuing of joint position statements seems to be a more effective tool and where it is easier to reach a consensus on issues. The participants of the Budapest World Water Summit agreed that "a new approach is required to water management, social and economic matters, particularly from the aspect of health, food and energy supply. They highlighted that water management should be governed by sustainability. The sustainability development goals to be prescribed for the period after 2015 should include one or ones specifically relating to water and wastewater treatment. They also agreed that actions need to be taken to reduce water pollution and to provide for reuse, and the goal to be worked out would lay emphasis on managing, and protection against, natural disasters relating to water. A new mechanism is required, one that will facilitate cooperation among governments in matters relating to water" (WBCSD, 2014: 8.).

The sustainability goals for the next period were adopted in September 2015:

1. Eradicate extreme poverty & hunger.
2. Achieve universal primary education.
3. Promote gender equality & empower women.
4. Reduce child mortality.
5. Improve maternal health.
6. Combat HIV/AIDS, malaria & other diseases.
7. Ensure environmental sustainability.
8. Develop a global partnership for development.

The most important international organization promoting green economy is the one called *(Global Green Growth Institute, GGGI),*, which was established by OECD, UNEP and the World Bank on the basis of an agreement reached in Rio de Janeiro in 2012. Its founding treaty was signed by Hungary as well. The primary objective of the GGGI is to facilitate sustainable development in developing and emerging countries, including even the least well developed countries. Hungary joined the institute in 2015, and concluded an agreement on the legal standpoint concerning the institution's privileges and exemptions, as announced in Act VII of 2016.

The *(Green Growth Knowledge Platform, GGKP)* is a global network of international organizations and experts, set up by the GGGI, whose primary objectives include sharing knowledge accumulated in relation to green growth, presenting and disseminating best practices and generating new research subjects relating to how the benefits of green growth can be incorporated in business and country strategies, as well as the management of all of the knowledge and information that has been amassed in regard to green economy and green growth (GGKP, 2015). Its conferences so far have discussed topics such as green value chains, green public procurement programmes, experiences relating to green labelling, eco-towns, green growth measurement, the role of financial policy in the transformation of the green economy etc. (Pomázi, 2013). The 2016 conference focuses on the transformation of development through inclusive green growth. World Green Economy Summit (2016) was aimed at strengthening partnership involving governmental financial policy, business and civil organizations to enhance green growth's contribution to the accomplishment of the goals of sustainable development by 2030, the climate policy and the Dubai Clean Energy Strategy (2050) (GGGI, 2015).

The results of the green economy are more palpable at a micro and mezzo level – such as green universities, green towns *smart cities* and green chemical industry – but it is not possible to specify countries that are operating green economies at a national level.

Measuring green economy performance in OECD countries and Hungary

OECD green growth indicators

In parallel with the adoption of the concept and endorsing the introduction of green economy the question of how green growth could be measured was also raised. Measuring the green economy means the selection of indicators and methods developed for the monitoring and assessment/evaluation of the transition to green economy. An attempt at measuring green economy was made on the basis of green growth indicators assigned to five different groups. There are further indicators within the main themes, each of which contribute to the economy's becoming increasingly green. Accordingly, the establishment of the degree of growing greener requires an extremely complex and careful analysis. Moreover, a more exact measurement of green growth necessitates joint management of the economic and environmental accounting systems, a system of national accounts expanded by the introduction of an environmental accounts *(National Accounting Matrix with Environmental Accounts, NAMEA)* (Pomázi–Szabó, 2013).

Table 1
Green indicator groups and themes

Productivity of the economy's environmental resources	• Carbon and energy productivity, • resource productivity: material, nutrient, water, multi-factor productivity.
The natural asset base	• Renewable stocks, • non-renewable stocks, • biodiversity and ecosystems.
The environmental dimensions of quality of life	• Environmental health and risks • environmental services and amenities.
Economic opportunities and policy responses.	• Technology and innovation, • environmental goods and services, • international financial flows, • prices and transfers, • skills and training, • regulation and management approaches.
Social and economic context and characteristics of growth	• Economic growth and structure, productivity and labour market, education, income, socio-demographic patterns.

Source: www.oecd.org/greengrowthindicators.htm

In regard to the productivity of the economy's environmental resources the OECD is assessing CO_2- and energy productivity, resource and material efficiency and environmentally adjusted multi-factor productivity. *The natural resource* index covers changes in land use and surface cover, renewable and non-renewable stocks as well as biodiversity. *The* heading of life quality comprises people's exposure to air pollution. *The subject of economic opportunities and policy responses* involves tools and instruments facilitating green economic transformation. The indicators reflecting the *social and economic features* of *growth* appear in a separate group (OECD, 2014).

The green index of our own development

In the course of a research project carried out under the aegis of the Hungarian Science Research Fund (*Országos Tudományos Kutatási Alapprogram, OTKA*) we studied what is happening in the globalized world and how the green economy concept appears and what are the characteristics of its development. One question that cropped up was whether it is possible to express the position of the green economy with just one indicator. Based on the OECD's green indicators we created a *green index* (GI), with the help of which we evaluated the performance of each OECD country, and compared it to the values of the FEI index[2] – also developed by ourselves to keep tracks of changes in the future external and internal

[2] FEI: future external and internal factors determining development. The FEI index is an indicator calculated on the basis of factors of development assigned to three dimensions, such as Future, External and Internal. The calculation and values of the FEI the GI indicators are presented and discussed in detail in *Intézményi változások és fejlesztési modellek* (Institutional Changes and Development Models), a study produced as a result of the OTKA research project (Bartha et al., 2013).

potentials of the OECD countries – in order to establish the countries whose development models may be worth following in the interests of future generations.

Calculation of the green index (Tóthné Szita, 2013b; 2014):

1. The first step is the calculation of the various countries' indicator indices with the help of the minimum-maximum statistics model, using the OECD green growth indicators:

$$Ii = (Xi - X_{min})/(X_{max} - X_{min}),$$

where *Ii* is the index of the various indicators (1–n);

Xi: the indicator under review;

X_{min}*:* the minimum value of the indicator under review in the OECD countries in the given year;

X_{min}*:* the maximum value of the indicator under review in the OECD countries in the given year.

This step also removes dimensions at the same time and produces a ranking order of the OECD countries in terms of the indicator concerned, on a scale of zero to one.

2. Thereafter, taking the average of the various indicator indices, we arrive at the green index of each country:

$$ZI = \sum_{i=1}^{n} Ii/n$$

The green growth index of each country varies from year to year because the various indicators are changing along different development paths. The countries ranking order in terms of the indicator indices also varies from year to year, as a consequence of which the ZI ranking order also keeps changing. What is surprising is, however, that the degrees of growing greener fell short of the expectations according to the method we used. The green growth indicator of even the most vigorously "greening" country did not exceed 0.5. Nonetheless, one advantage of the method is that it enables relative comparisons across countries. The factors playing a dominant role in the development of the green index are also worth looking at.

Table 2

The countries with the best green performance ratios in terms of the green index

2005	**2008**	**2010**	**2012**
ZI = 0.41 – 0.51	ZI = 0.43 – 0.48	ZI = 0.41 – 0.46	ZI = 0.39 – 0.43
Luxembourg	Netherlands	Netherlands	Austria
Netherlands	Norway	Korea	Korea
Norway	Luxembourg	Norway	Netherlands
Austria	Austria	Switzerland	Germany
Korea	Switzerland	Austria	Norway
Japan	Israel	Japan	Luxembourg
Germany	Germany	Israel	Japan

Source: Own calculations, based on OECD database

Hungary's Green Indices: 0.3; 0.33; 0.315; 0.31. The best performing countries in terms of FEI and GI: Austria, Denmark, Norway, Switzerland and Sweden. These are the countries that we found to have achieved the most vigorous green development based on eco-innovation, facilitating the development of a sustainable society. These countries may therefore be regarded as setting an example to be followed in order to provide for the welfare of the coming generations. Higher green indices are calculated, of course, if an emphasis is laid on the efficiency of environmental resources or the elements of natural capital. It is also clear, however, that the dynamic of growing greener varies across countries and the various countries' "greening" ratios relative to other countries seems to stabilize after reaching a given level.

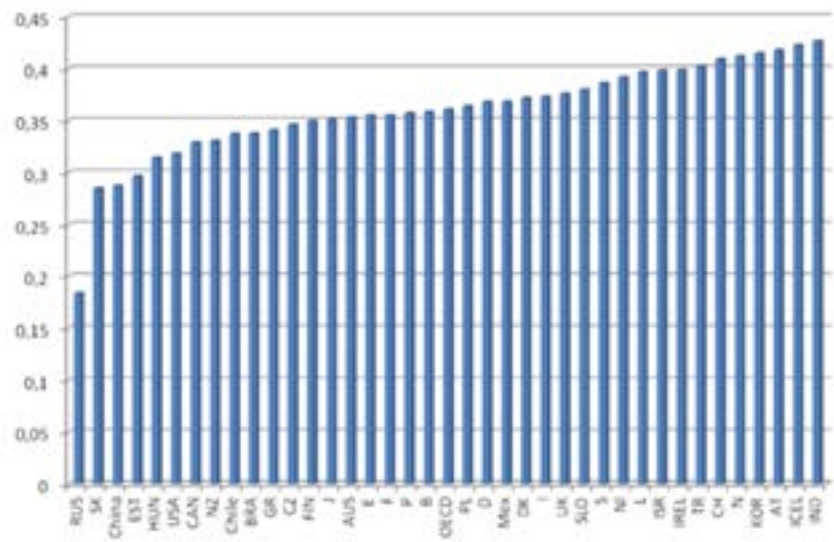

Figure 1
Green indices of OECD and BRICS countries in 2013

Source: Own chart based on OECD data

Hungary's green performance

Hungary has higher than average indicators among OECD countries in terms of the following indicators: in state-funded R&D expenditures in 2007 and in green patents in 2008, as well as the ratio of the patent applications submitted relative to the total number of patent applications. The composition of patents is in a significant relationship with R&D subsidies pertaining to energy efficiency and water quality improvement. Interestingly, environmental taxes in Hungary approximated 3% of GDP up to 2007. This percentage rate has decreased since then but it is still over the OECD average.

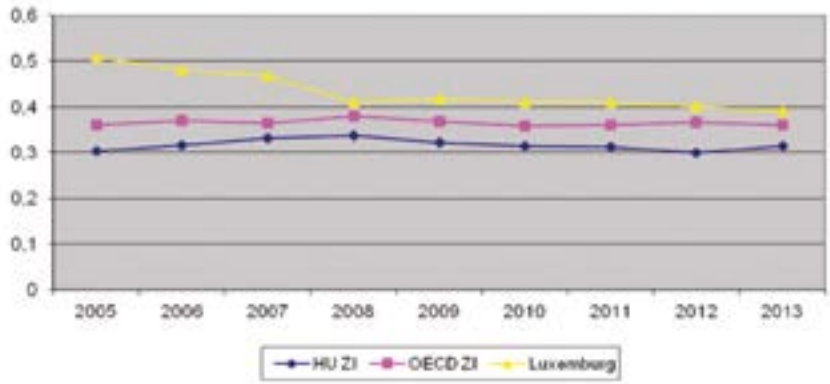

Figure 2

Changes in the green indices of Hungary, Luxembourg and the OECD

Source: Own chart, based on OECD database

Based on the changes in the green indices, a view of the values of Luxembourg, which was in the best position in 2005, those of Hungary and the OECD countries, reveals that the average green index of the OECD countries peaked in 2008, thereafter it decreased somewhat, while that of Luxembourg dropped dramatically, while Hungary's index remained more or less unchanged. At the same time, by looking at the trends in the changes of the various index elements in the various countries one can identify a gradual eco-efficiency improvement and a *decoupling* effect as well.

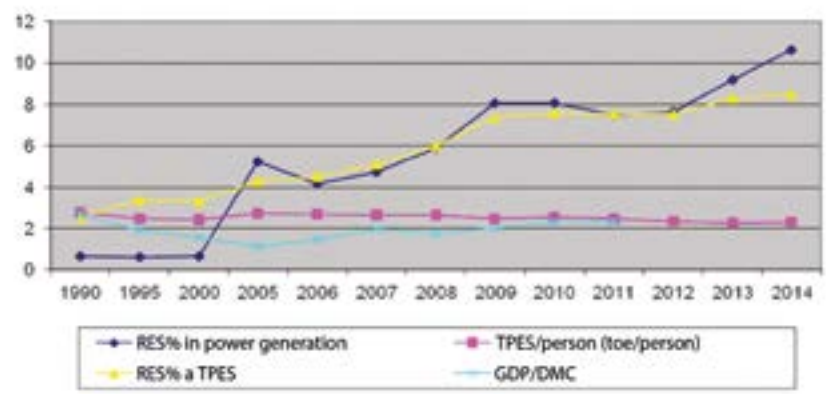

Figure 3

Changes in some of Hungary's efficiency-related indicators

Source: Own chart, based on OECD database

Resource-efficiency, direct material use and the ratio of renewable resources – playing a dominant role in becoming greener – are showing favourable changes. No such marked changes have occurred in resource-efficiency and in direct material use as in the generation of energy from renewable energy sources, the ratio of which have increased from 3% to 9% and to 11% during the past 25 years.

Green performance is also driven by such projects facilitating the greening process that are focused on towns, specific institutions or sectors. In relation to the Zöld Nyíl *(Green Arrow)* project the town of Miskolc worked out its future vision on the basis of a movement called Zöldebb Városokért *(for greener cities)* and it may become the first green model town. Miskolc has embarked on a road towards sustainability: it has had its sustainable development strategy worked out.[3] A green town is one which generates immense economic and social benefits, using nature's free services. The following basic principles need to be taken into account in the projects announced in 2016 with the aim of creating green towns TOP 2.1.2-15):

- reintegration of Hungary's settlements into their surrounding ecosystems,
- aiming at achieving sustainability,
- integration,
- interdisciplinarity.

In its green office programme launched in 2010 the University of Szeged has become Central Europe's greenest university, according to a survey carried out by an Indonesian university. It was ranked among the 20 greenest of 360 universities of the world in 2014. Five other Hungarian universities have also joined the green university programme. The University of Szeged is committed to sustainable infrastructure development and awareness raising. A geothermal cascade system has been put in place, they have created a greywater system for the secondary utilization of rainwater, their solar cell capacity exceeds 1 MW and they have put in place a unique thermal pump system for utilising waste water heat, with a 100% EU aid intensity.

The green index in the context of other indices

A look at the green index in the context of human development index and the ecological footprint shows that a higher green index may be accompanied by a higher ecological footprint and HDI *Human Development Index* or even by a biocapacity overrun. Nearly every one of the EU member states exceed their biocapacities, except for Sweden and Norway where there are biocapacity savings. High welfare ratios expressed in terms of the HDI results, in the majority of cases, in environmental deficits. Hungary has a HDI of 0.823 but its ecological footprint is only 2.9 global hectare per person, its biocapacity is 2.2 global hectares, i.e. even though the deficit has decreased, Hungary was still 34% beyond its biocapacity in 2012.[4]

[3] www.green-city.hu/green-city-mozgalom-elso-magyarorszagi-mintavarosa

[4] www.footprintnetwork.org/ecological_footprint_nations/; http://hdr.undp.org/en/data

Table 3
Ecological footprint, biocapacity, HDI and GI in certain countries, in 2012

	Eco-footprint gha/person	Biocapacity gha/person	Deficit of biocapacity savings (gha)	HDI	Green Index (2012)
Austria	6.1	3.1	–3	0.884	0.435
Belgium	7.4	1.2	–6.2	0.889	0.35
Denmark	5.5	4.8	–0.7	0.921	0.379
Netherlands	5.3	1.2	–4.1	0.92	0.427
Poland	4.4	2.1	–2.4	0.838	0.317
Luxembourg	15.8	1.7	–14.7	0.888	0.4
Hungary	2.9	2.2	–0.7	0.823	0.3
Germany	5.3	2.3	–3	0.915	0.413
Norway	5	8.2	3.2	0.942	0.409
Switzerland	5.8	1.3	–4.5	0.924	0.369
Sweden	7.3	10.6	3.4	0.904	0.384

Source: Own edition, based on footprintnetwork, HDI and own research findings

Global green index

The global green index *(Global Green Economy Index, GGEI)* monitors green performance ratios of 60 countries on the basis of four main criteria: management and climate change, sector efficiency, market and investments, environment and natural capital (Tamanini et al., 2014). The results of the evaluation show that some emerging countries produce remarkable green performance ratios, while developed countries are not always up to the expectations. The green performance ratios of some countries are actually over-estimated. Of the 60 countries South Korea and Japan are in the 39th and the 44th position, respectively. The United Kingdom is also making good efforts, yet it falls behind its Scandinavian peers. Table 4 shows the 10 best performing countries in the areas under review, showing that countries perform differently in the various categories. A comparison with our green index results however, reveals that the best performing countries are nearly always the same.

Table 4

The 10 best performing countries in terms of the GGEI (2014)

	Efficiency of the sectors	Sustainable architecture	Market and investment	Country ranking order (green towns)	Ranking order of green towns
The 10 first ranking countries	Sweden, Costa Rica, Norway, Columbia, Austria, Switzerland, Zambia, Portugal, Germany, Chile,	USA, Finland, EAE, Canada, Taiwan, Sweden, Costa Rica, India, South Korea, Chile,	Denmark, Germany, Finland, Sweden, Spain, USA, Austria, Greenland, Brazil, Ireland,	Denmark, Netherlands, Sweden, Canada, UK, Germany ,USA, Finland	Copenhagen, Amsterdam, Stockholm, Vancouver, London, Berlin, New York, Singapore, Helsinki, Oslo

Source: Tamanini et al., 2014

It was also revealed by the study that the performance of green towns in the United States and in Norway fall short of the green performance of their respective countries as a whole. The above examples prove how difficult it is to measure, and compare the performance of green economies across countries. Although the GI makes it easier to compare countries with one another, yet it does not, in itself, fully express the transition to a green economy, because GDP growth may counterbalance the decrease in biodiversity, or health impairments, while the index itself remains unchanged.

Measuring the EU's green performance

In its internal market the EU has introduced the technique of measuring and comparing the *Product Environmental Footprint, PEF* and the *(Organization Environmental Footprint, OEF).* These indicators specify the emission of greenhouse gases that can be linked to the product or organization concerned, and their respective resource use, as the most important environmental stress factors, on the basis of life cycle analyses (EC, 2013).

Table 5

Ranking order of the 27 EU member states in terms of eco-innovation and environmental performance

Country	Ecological indicator	Material productivity	Energy productivity	Water productivity	CO_2-emission
Finland	1	26	26	18	24
Denmark	2	24	17	12	19
Germany	3	10	19	14	17
Austria	4	20	18	16	15
Sweden	5	18	25	17	3

Belgium	6	13	24	21	20
Netherlands	7	2	23	10	21
United Kingdom	8	4	14	11	16
Ireland	9	27	16	–	25
Spain	10	16	11	23	11
Italy	11	6	10	27	10
France	12	7	20	19	8
Luxembourg	13	8	27	–	27
Slovenia	14	25	15	–	13
Czech Republic	15	15	21	15	23
Portugal	16	19	4	24	7
Hungary	17	3	7	7	5
Malta	18	1	3	22	4
Cyprus	19	22	13	25	22
Latvia	20	21	2	6	1
Bulgaria	21	14	6	13	12
Estonia	22	23	22	–	26
Greece	23	11	9	26	18
Poland	24	12	5	8	14
Romania	25	17	1	20	2
Slovakia	26	5	12	–	9
Latvia	27	9	8	9	6

Source: www.soltub.hu/karbonlabnyom/?hu_oko-innovacio,19

The data in the table show that the ecological performance of the countries ranked ahead in terms of the ecological indicator falls short of lower ranking countries. It is also concluded from these data that there is no country that could be looked upon as a model, showing good practices worthy of following in all respects. Hungary's environmental performance is relatively good but in eco-innovation its performance is just about average.

Arguments for the green economy, *and concerns faced*

The main objectives of green growth and green economy include increasing well-being and reducing social inequalities, while achieving material reductions in environmental stresses. Meeting such objectives means that even requirements of green development are being met, which amounts to a quality quantum leap relative to green (economic) growth, in the direction of sustainable development, i.e. it entails aggregated results for the environment, the economy and the society alike.

In Europe's green future vision human activities are performed with a view to the fact that we are parts of a rich but finite and fragile ecosystem that is based on mutual dependencies and that the economy is only a means that can be used for satisfying basic needs and requirements and for improving the quality of life, for all, today and in the future. No healthy

economy is possible without a healthy Earth. *A future vision of green economy focuses on social and environmental justice and equality within and among nations.* This involves just utilization of the Earth's resources, bringing the widening of the gap between the rich and the poor to a stop and reversing the process. We are making efforts to reduce inequalities in the distribution of energy and in access to resources. Everyone has a right to have his or her basic needs (for clean air, water, food, soil, shelter, energy, health and freedom) satisfied. All people have a right to solidarity, democracy, self-determination, autonomy, responsibility, dignity and self-actualization. The economy should increase, rather than decrease, welfare. Green economy is an innovative and creative economy in which a central role is played by investment in sustainable development and green technology. This is an adaptive economy, which creates a host of new opportunities, particularly in the labour market, and enables everyone to make full use of his or her talent. Reduction of the intensity of the use of natural resources is the key to making the economy green.[5]

All sectors of the economy are affected by environmental issues, particularly the ongoing climate change, which is being driven by the use of fossil resources. Agriculture, food and water supplies are among the most heavily affected sectors. Air pollution, the acidification of ecosystems, shrinking biodiversity and climate change are environmental issues materially affecting people's well-being. Each of these can be alleviated by green economy, however, besides the benefits it also raises certain security issues (Green Capital, 2010).

All anthropogenic activities – from the extraction of resources through production to waste treatment and disposal – carry some environmental risk. Let us just think of mining and the disasters and emergency situations occurring during mining operations, such as Chernobyl, the cyanide poisoning of the river Tisza, or the red sludge disaster of Ajka. The designing of products and technologies based on environmental awareness in environmental protection and nature conservation is crucially important for national security. This is because citizens' perception of safety is fundamentally determined by whether they can access the energy, food and water required for their day-to-day activities, their very lives, together with other necessary and indispensable goods as required for their normal ways of living and for their health, along with whether these are available at affordable prices.

The proportions of green goods, green jobs and green technologies increase in a green economy. Their acceptance however, is not quite self-evident. A questionnaire based survey conducted by Eurobarometer has found that Hungarian respondents are more sceptical about green products than the average European respondent; about 60% of Hungarian respondents do not trust green products.

Circular economy as an European alternative to green economy

The concept of *Circular Economy (CE)* takes an approach to embarking on a sustainable path and greening the economy from the perspective of waste. Its basic philosophy is that the use using of the waste output of one system as the input to another system enables resource savings and reduces environmental stress. This approach is a combination of multiple theoretical

[5] Európa zöld gazdasági jövőképe (Europe's green economic future vision) https://europeangreens.eu/euroarchive/fileadmin/logos/pdf/policy_documents/economic/743660HU_Europa_zoeld_gazdasagi_joevokepe.pdf.

concepts and practical solutions, such as ‘cradle to cradle, “blue economy” (Pauli, 2010) or biomimicri. The processes of the metabolism of a circular economy take place in a closed system where nearly 100% of all waste and by-products are reused or recycled. Accordingly, biological components and resources are not mixed with technical ones. Social and economic metabolic processes are organized similarly to processes of environmental metabolism, forming a typical industrial ecological system. People in the European Union use some 15 tonnes of materials per year per person, of which 4.5 tonnes of waste is produced, more than half of which is deposited in landfills. Switching to a circular economy lays emphasis on reuse, repairs and recycling, turning waste into resources. According to some estimates ecodesign and waste prevention may help businesses in Europe save up to EUR 604 billion, equalling some 8% of their turnover and reducing GHG emission by 2–4%. Proponents of circular economy find the model to be offering opportunities for benefits in sustainable economic growth, job creation and efficiency improvements (Ulmann, 2015). The MacArthur Foundation (EMF, 2015) is the most prominent champion of the cause of Circular Economy.

The circular economy model

The idea of the CE is based on three key principles. The first one is the protection and development of natural capital through controlled use of decreasing stocks and balancing the flows of renewable resources. This assumes a marked reduction in materials and creates, for instance, the conditions required for soil regeneration. The second basic principle is improving the efficiency of resource utilization through developing a circle of products, components and materials, maximising their involvement in the technical and biological cycle. In other words, this involves a highly organized scheme of remanufacturing, refurbishment and maintenance in order to maximize the time materials are kept inside economic processes. The third basic principle is minimising negative external effects through eliminating or substituting, or reducing the use of, toxic materials/substances. Careful selection of substances and materials in the design phase enables reduction of waste and harmful emissions, while fossil resources may be replaced by resorting to energy from renewable energy sources (EMF, 2015).

The European Commission’s interpretation of circular economy is an economy involving the following:

- increased recovery/recycling and prevention of the loss of valuable materials,
- job creation and economic growth,
- with the help of new business models, ecodesign and industrial symbiosis, transition towards the implementation of the “zero waste” concept,
- reduction of GHG emission and environmental impacts.

The circular economy model is based on closing open economic flows (EMF, 2015). According to proponents of circular economy:

- waste is nutrient,
- diversity is virtue,
- energy must be derived from renewable energy sources,
- prices should reflect reality,
- one must think in terms of systems (EMF, 2015).

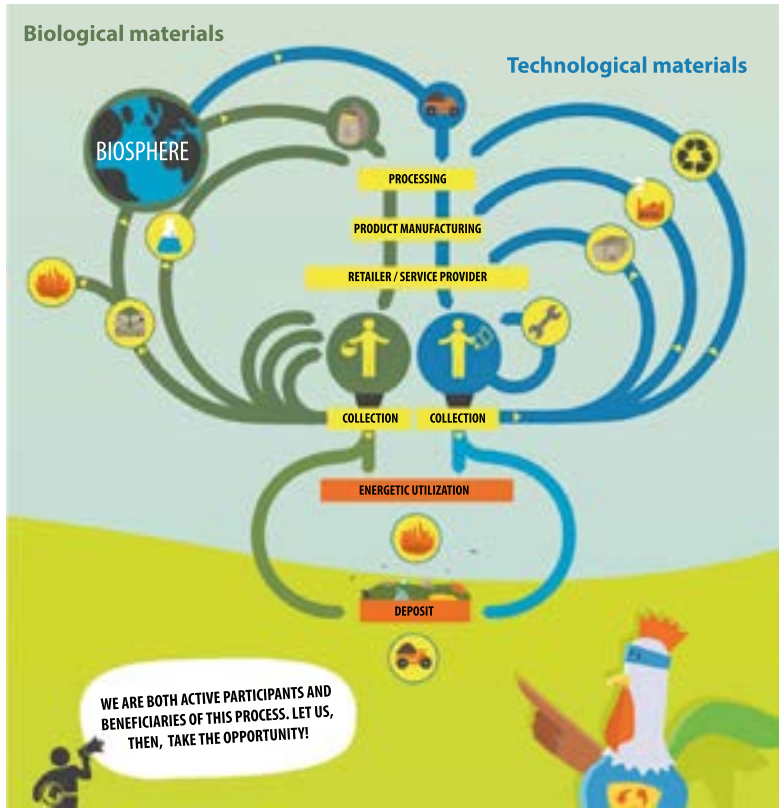

Figure 4

The circular economy model

Source: http://vallalkozas.hulladekboltermek.hu/tudastar/korforgasos_gazdasag/

The purpose of the package of legislation adopted by the European Commission on 2 December 2015 concerning the circular economy is to "stimulate Europe's transition towards a circular economy, boost global competitiveness, foster sustainable economic growth and generate new jobs" (EB, 2015). It is in view of long term considerations that the package aims at reconsidering waste management and building up a new regulatory background by integrating the life cycle approach, encouraging best solutions adapted to life cycle phases and closing processes. Businesses' introduction of circular economic processes should result in estimated savings of 8% for them, while cutting GHG emissions by 2–4%.

A number of requirements have been identified and regulations have been introduced concerning the implementation of the action plan, such as the directive on ecodesign, regulations pertaining to product requirements, the regulation of manufacturers' responsibility and liability, specification of policy requirements etc. In Europe, for instance, the Netherlands is a committed proponent of the circular economy, which presented a number of positive examples at a conference organized in Budapest in 2016 by the Dutch Embassy and its four partner organizations. At the end of the conference the participants concluded that there are highly inspiring solutions, the spreading of which requires continuous knowledge transfer.

People's attitudes need to be changed if the method is to gain wide acceptance. Although new solutions of sustainable resource management are available for businesses, their application in practice and the development of adequate and suitable incentives depend on governmental and EU action plans.[6]

The circular economy and security

Experience drawn from processes implemented so far shows that the following benefits are offered by what is called circular economy (Rower, 2016):

- material and energy saving,
- decreasing prices and increasingly reliable availability of raw materials,
- decreasing/elimination of negative external environmental impacts,
- new job creation,
- fostering innovation,
- improving international economic competitiveness,
- durable benefits for a resilient and sustainable economy.

Security depends on whether in order to enjoy the benefits economic operators adapt fair practices and procedures to fully observe considerations relating to the processes of production, green jobs, product quality, labour safety, occupational health and environmental protection.

Resource management and environmental protection

Providing for the availability of resources is a critical issue for green economy, and specifically, circular economy. Resources – raw materials and primary sources of energy – are an indispensable input factor for the operation of any economy and the basis of the welfare of any society. The extraction/production of resources is a drastic intervention in the environment and their use results in imposing a stress on the environment through the waste output of the production chain.

Access to energy sources has, throughout human history, always been among the most prominent causes of war. Adequate energy supply is indispensable for the safe and reliable functioning of any economy. The *National Energy Strategy* ensures long term sustainability and security of Hungary's energy supply and it is the basis of economic competitiveness. In line with Hungary's primary national interests the Strategy guarantees the security of supply, applies the least cost principle, observes environmental aspect and makes it possible for Hungary to make a contribution to the resolving of global issues to an extent that is in proportion with its international weight and the scale of its resources. To achieve the above objectives, it specifies five key endeavours:

- enhancing energy conservation and energy efficiency,
- boosting the proportion of renewable energy sources,

[6] http://hungary-hu.nlembassy.org/news/2016/05/korforgasos-gazdasag-konferencia.html

- integration of the Central-European pipeline/transmission line networks and putting in place the necessary cross-border capacities,
- maintaining the existing nuclear energy capacities and
- enhancing the state's role in the energy market.

The most important objectives of the 4th National Environmental Programme[7] are to protect the quality of life and human health, to protect natural values, to promote economical management and use of resources, to improve efficiency and to make processes increasingly green. These objectives are intended to be accomplished through operational programmes between 2014 and 2020. Climate change is a central element of the programme. Resource management and environmental protection are closely linked to each other. Different authors have, of course, worked out different future visions as well, outlining the energy management for the coming period on the basis of different priorities.

Based on a 1.5% increase in demand for electricity *MAVIR's 2030 projection* uses two possible scenarios, in each of which a key role is assigned to nuclear energy. In the best-case scenario all of the potentially expected power plant investments are actually implemented and the future operation of the existing units is also adapted to the positive expectations. The scenario based on a scarcity of resources factors in a variety of unfavourable trends affecting gas-fired power plants and it also expects that some envisaged investment projects fail to be implemented. Interestingly, this includes up to 1.4–4 times the figures contained in the renewable action plan (Jávor, 2016).

The *Vision Hungary 2040* scenario of the *Erre van előre!* (This way forward) Project outlines an ideal future vision, encompassing all economic sectors, assuming optimum development possibilities for sustainable energy efficiency solutions right from the outset (2005), primarily in regard to the regulatory environment and the commitment of decision makers. A holistic approach was applied in particular in the design of the future vision, including, for instance, cooperation with other sectors, and the human factor. Based on their own research the authors adjusted the existing biomass potential figures, removing a number of inconsistencies, and they also noted that the use of renewable resources alone cannot not guarantee sustainable utilization of resources. The key elements of the future vision include efficiency, modesty and the application of strict sustainability restrictions concerning renewable energy sources (wind, solar, hydro energy, biomass, ambient heat and geothermal energy). According to their future vision "an energy system, operating solely on the basis of renewable energy sources in a sustainable way even from strict ecological considerations, could be put in place in a matter of 30–50 years" (Jávor, 2016: 28

Greenpeace prepared its Scenario 1, covering the period up to 2050, using the so-called *backcasting* method, that is, by determining future objectives and target figures, such as that Europe's CO_2-emission should be reduced to 3 t/year/capita, and that nuclear energy should be phased out with the help of energy efficiency improvements. In Version 2 of 2011 "they reduced the economic useful life of coal-fired power plants from 40 to 20 years, while in regard to renewable energy sources they used the renewable industry's progressive calculations: in transport they brought forward the introduction of electrical vehicles by

[7] The 4th NEP for 2015–2020 was adopted by Parliament as late as in 2015, by Parliament Resolution No. 27/2015. (VI. 17.), which was published in Magyar Közlöny in its edition 083 of 2015.

10 years, they factored in a faster spreading of smart networks and they assumed that no enhancement in the generation and use of energy from fossil fuels would take place from 2015 on" (Jávor, 2016: 28.).

The structure of the energy portfolio is of particular importance for environmental safety and CO_2-emission. Climate policy objectives include increased reliance on renewable energy sources, primarily to cut GHG emissions. However, the fact that some 80% of the total renewable energy used is of agricultural origin, that is, biomass for the most part, and that more than half of the total renewable energy used is based on burning wood at power plants and by households, constitutes a sustainability risk. According to the target figures the share of biomass is expected to drop from 86% in 2010 to 69% in 2020 on the whole within the use of renewable energy for heating and cooling, while the target figure of the use of solid biomass for individual heating will remain extremely high, with all other ways of renewable energy use lagging way behind.

From a social perspective, a shift towards renewable energy sources in resource management will entail the creation of new jobs. According to the renewable energy strategy the entire system of the utilization of renewable energy may result in 103,000 new jobs up to 2030, 80% of which should be created in rural areas. The strategy identifies the use of by-products and organic waste for energy production as the most important source of jobs, for more than 23,000 people (Buday–Malik et al., 2012).

Eco-innovation is expected to play an outstanding role in resource management (efficiency improvement) and in environmental protection as well, as is also reflected in the EU 2020 strategy. Human resources will, accordingly, grow more and more important, because no innovation is possible without highly qualified and creative professionals. Eco-innovation comprises innovation activities reducing the use of natural resources, and harmful emissions, during the entire lifetime of any given product or service. It is an approach to creating products and services based on optimized resource use in all phases of their respective life cycles, striving for zero emission through the circular management of resources. Eco-innovation is practised in awareness of the need for cutting GHG emissions by 20%, for raising the share of reusable resources to 20% and increasing energy efficiency by 20%. The reduction in the use of materials through eco-innovation decreases the exposure which is associated with the risks of material and resource supplies and the rising of prices as a consequence of dependence on imports.

Economic considerations are today some of the most important motors of eco-innovation. A recent survey found that about half (52%) of the businesses introducing eco-innovation considered the current or the future energy prices to be a crucial factor (52% and 50%, respectively). High material prices was also found to be a key consideration (45%). Many of the businesses had introduced eco-innovation in order to be able to comply with regulations, including rules on taxation.[8] Solutions produced by eco-innovation positively affect resource management and material flows as well as the environmental impacts of consumption (Dombi et al., 2015). Another question, is, of course, how eco-innovation solutions can be evaluated and how they affect the three pillars of sustainability. This is why there is a need for reviewing the methods that can be possibly applied in the assessment of the impacts of eco-innovation solutions.

[8] www.soltub.hu/karbonlabnyom/?hu_oko-innovacio,19

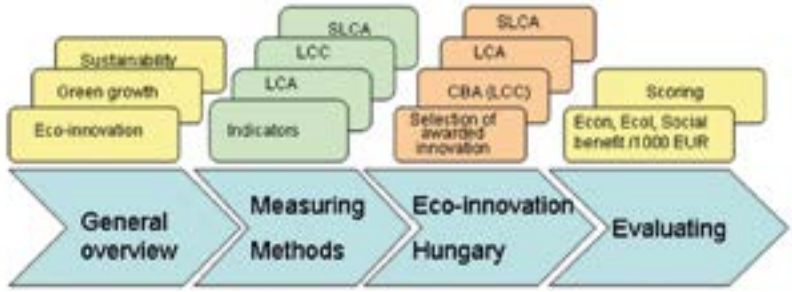

Figure 5
Methods applied in examining eco-innovation

Source: Szita Tóth, 2013

On the other hand, the practical introduction of even the most promising solutions produced by eco-innovation (even award-winning innovations) may be hindered by considerations of operational safety.

Environmental, economic and social impacts of resource management

Improvements in efficiency and increased reliance on renewable energy sources are among the key indicators of green economy, besides the economical (conserving) use of resources. But what implications do these have from a social, economic or environmental aspect, besides increased green economic performance? How is it possible to single out the resources that should be prioritized? Which one offers more social and economic benefits while entailing reduced environmental impacts? Such questions may be answered with the help of the method called *Life Cycle Sustainability Assessment, (LCSA).* In the life cycle sustainable assessment of fossil fuels and renewable energy sources one must examine the extent of the environmental impact entailed by the generation of a unit (1 MJ) of usable energy, together with its cost and its social impact. Life cycle sustainability is, according to the following formula, determined – in view of the three pillars of sustainability – by the aggregate of the environmental LCA *(Life Cycle Assessment)*, life cycle cost and the social LCA (Szita–Roncz, 2017).

$$LCSA = LCA + LCC + SLCA$$

Regarding the sustainability ratios of the current situation to be 100% for each pillar, their aggregation and the calculation of their average also produces a 100% life cycle sustainability ratio. This will then be the basis of the assessment of the sustainability of various scenarios, because their environmental indicators (the impact category indicator values), economic indicators (*Life Cycle Costing, LCC*) and social indicators (*Social Life Cycle Assessment, SLCA*) concerning the prevailing situation (Scenario 1) are specified as a percentage of the relevant values. The dimensions having been removed, the values can be aggregated and by calculating an average we have produced a single indicator expressing the efforts made towards sustainability. With existing cost figures taken into account together

with the savings from the assumed 50–75% recovery/recycling ratios and the supplementary material and energy requirements it is possible to specify the expected input costs for the various scenarios, along with the relevant environmental impact changes and the social impacts as well (e.g. job creation). These steps enable the evaluation and comparison of development scenarios and the elimination of any risk.

Advantages

The advantage offered by this method is the possibility of optimising the technology and establishment of sustainability parameters. With the help of some innovative technology, by introducing a new production line, a company extracts (50–75% of the) valuable material from its production residues that should be treated as waste, saving raw material and cost, creating new jobs, but the process takes added energy entailing additional environmental stress, while at the same time the amount of disposable waste is significantly reduced. In this case it is possible to make an assessment of the complex impact relative to the basic technology and it is possible to avoid the risk of increased environmental impact in comparison with the basic scenario. This method can be equally applied to technologies, products and sectors.

Risks

Making resource management increasingly green, particularly by introducing circular economy, entails a risk of recovery from waste generating unknown impacts which may have harmful consequences in terms of labour safety (fire, explosion, toxic substances), health and environment (soil, water, air). The designing, implementation and licensing of such technologies takes particular attention and precautions. As can be concluded from the circular economic model, the chain of production interacts with environmental elements in a variety of phases, where potential environmental impacts can be avoided by applying suitable technologies, eliminating the fire and explosion hazards and by the introduction of labour safety equipment.

The most important safety issues

Resilience can be strengthened through multiple channels in the context of green growth: through economic diversity, by conserving the ecosystem, by achieving energy security, sustainable production and consumption and/or by improving resource-efficiency. Moreover, consistent implementation of green growth strategies mitigates shocks caused by harmful impacts and enables the satisfaction of the growing demand of communities in terms of housing, energy, food, transport and water. While emphasis is laid on development and on reducing poverty, risks may be mitigated by reliable scientific projections comprising an ecosystem based approach.[9]

[9] www.greengrowthknowledge.org/theme/risk-resilience 2012

The transition to green economy facilitates the achievement of a variety of sustainable development goals. Greener transport, increasingly resilient agriculture, infrastructure and towns, all contribute to the accomplishment of sustainability. All strategies towards greener economies and practices have, as their central elements, issues such as energy, climate change, the use of renewable resources, environmental improvement – with a focus on aquatic resources and water use – as well as, in regard to business and economy, reduction of CO_2-emissions and making transports greener. Based on strategies and scenarios worked out in relation to energy management we have made an attempt to discuss the motors of green society development, together with the associated potential gains and hazards, which may also be interpreted as pros and cons.

Table 6

Motors of green economy – gains and risks

Motor	Gain	Threat
Economy	• preference of solutions enabling material and energy savings, • access to support schemes, increased profits, • cost cutting resulting from reduced waste output	• risky investment unless technological parameters are optimized, • lost profits on invested assets, • operating licence denied in the absence of safety measures
High material and energy prices	• cheaper raw materials and more reliable supplies through closing processes into cycles, • extraction of valuable materials by urban mining, • energy supply from renewable resources (solar panels, collectors, heat pumps, geothermal energy), cost saving, • building insulation, design of buildings with optimized energy consumption, reduced energy dependence, • introduction of new materials, growing markets, • cost savings	• quality degradation, appearance of new types of hazardous waste, • increased demand for energy, the wrong combination of different types of energy, • unknown health hazards, • energy supply issues, • loss of market position, • food supply issues as a consequence of increased use of primary biomass, • increased air pollution due to direct biomass or waste incineration, • high degree of uncertainty as to long term effects, • decreasing lifetime and safety/security
Society	• new jobs, • more liveable environment, more secure livelihood, new green jobs, • expanding professional profile, • products of the 4th industrial revolution gaining ground, • knowledge intensive technologies	• accidents, health impairment, breach of labour safety regulations, • absence of labour safety training/ briefings, lack of protective equipment, • loss of jobs

Resources	• expanding/increasing stocks of resources, through landfill mining, extraction of rare element content of refuse dumps • increase in the value of human resources, increasingly extensive education and training	• unpredictable impacts and effects of special – unorthodox – technologies, • emergency situations, water pollution, land use, shrinking biodiversity, • decrease in natural capital, • poor motivation of those without adequate qualifications
Environment	• decreasing environmental stress of waste, • no decrease in biodiversity, • conservation of natural values, • retaining of ecosystem service	• polluting effects of new technologies, their material and resource requirements, • decrease in natural capital, • degrading environment, • new pollutants, • loss of biodiversity, • health impairment
Technology	• development and sale of new technological lines, job creation	• special treatment of dangerous substances and hazardous waste, emissions, health impairment, water and soil contamination, health hazards, • decrease in natural capital

Source: Own edition

It is clear that besides economic benefits, decreasing natural capital and health hazards faced by the population concerned can in many cases be associated with the factors driving the transition. And the impacts and effects of natural capital – directly in the value change and through the supply chain – cannot be disregarded, indeed, its decrease triggers a variety of ripple effects.

Table 7

Effects of natural capital in the value change

	Direct	**Supply chain**
financial services	2	98
food and beverages	2	98
banks	3	97
vehicles and components	3	97
technologies	4	96
personal and household products	5	95
telecommunication	5	95
media	6	94
trade	6	94
health protection	10	90
real estate	14	86

industrial goods, services	30	70
insurance	33	67
construction, construction materials	35	65
chemicals	40	60
oil and gas	47	53
travelling and recreation	49	51
basic resources	63	47
consumer goods	92	8

Source: TRUCOST DATA

The safety of the introduction of green economy lies in the following:

- Are we going to be able – on the basis of technological projections – to get prepared for risks entailed by the various development alternatives?
- Can we acquire knowledge required for the development and use of new technologies and for the reuse/recovery/recycling of products and services created with the help such technologies?
- Can we adopt the philosophy of green economy and circular economy?
- Can we identify and objectively measure the actually advantageous green economy solutions?
- Will there be sufficient governmental will and support concerning the introduction and operation of solutions facilitating the green economy and for the necessary knowledge transfer?

In order to see the green economy, as a new sustainability strategy, prevail, there is a need for a supporting institution system, for supports to help funding the developments, for loans and a coherent regulatory system that is suitably adapted to development strategies affecting the various specific fields (economic, environmental, education, health etc.) and that can manage these based on a systemic approach. There is a need for a good coordinating role on the part of the institution system and, instead of parallel functions, for increased synergies. There is a need for implementing R&D activities in a triple-helix structure. There is a need for new consumer attitudes that accepts a transition towards a green economy, for a new production culture and new competences.

Education has an important role to play in creating competences required for creating eco-innovative production systems, but also in having the importance of retaining ecosystem-services in the long term integrated in the system of social values. Particular attention must be paid to development based on eco-design, to ensure material and energy conservation and improve eco-efficiency. Besides coordination and a holistic approach, there is a need in planning for laying down objective and life-cycle based foundations for rational decisions. In addition to the above, attention must be paid in both resource management and environmental protection to general national security issues that have an impact on, and that keep delaying, the successful achievement of the goals in these two areas (biological and nuclear weapons, cyber-attacks, climate change, crime – as the main threats of the coming decade).

Summary

It is difficult to give straightforward answers to the questions raised in the introduction. Green economy is expanding, no longer only as an alternative economic arrangement for a way out of the crisis but also as one of the guarantees for a transition towards sustainable development. Efforts aimed at boosting the performance of green economy are supported by international organizations, and attempts have been and are being made to measure this performance, contributing, at the same time, to improving the perception of sustainability. The green economy can be measured by a variety of ways: in addition to the green growth indicators worked out by the OECD they include the green index, the eco-innovation index, the product footprint, the ecological footprint, the assessment of biocapacity, energy efficiency, land use as well as the comparison of the indicators with other types of ratios. On the other hand, any assessment of the performance of green economy requires complex and careful analysis. Definite signs of the green economy – or rather, the economy's growing increasingly green – in the chemical industry, in construction, waste management, at education institutions and municipal governments, along with signs visible in transport and tourism. The green transition has also been facilitated by the availability of funds through application schemes. Its expansion in the future depends to a large extent – besides decision makers and people familiarising themselves with the essence of the concept, and besides its acceptance – on the supportive influence of the regulatory environment and the availability of funds through application schemes. The assessment of the benefits and the impacts of the risks of the green economy, the promotion of comparative studies based on life cycle analysis, have a positive impact on the population's environmental sensitiveness. Civil society organizations may also play a role in this type of awareness raising. It is important that the consequences of decisions are identified and that their environmental, economic and social impacts are managed together. The risk mitigation of objective assessments should be based on the correct identification of the life cycle, on the designation of the phase that actually spans between cradle and grave or between cradle and cradle.

Preference has lately be given to what is termed as circular economy over green economy, together with the development of programmes for this newly adopted concept. Besides economic gains (through cutting costs of waste treatment and raw materials) circular economy achieves reductions in environmental impacts through suitably chosen technologies. A comparison of the two alternatives reveals that the concept of circular economy is narrower than that of green economy. Having received targeted funds through application schemes, with innovative waste treatment technologies businesses may move towards sustainable production. It is a clear benefit when through circular management – recovering part of the materials required for the technology from waste – they need to purchase less materials and have their waste output reduced, but it must also be noted that such technological solutions generally entail additional resource inputs. An assessment must be made of the additional investment required for enjoying the benefits of material recovery and whether the emissions of the new technology entail even greater pollution than those of the original technology. The introduction of circular technologies is justified when the combined environmental, social and economic impacts over the entire life cycle of the resulting product do not exceed those of the original technology. Such an assessment is not possible without

a comparative impact assessment based on life cycle analysis. An increase in the aggregate energy consumption may be offset, to some extent by using renewable energy sources.

The justification of the introduction of green and/or circular economy cannot be called into question. Their basic underlying concepts include material and energy conservation, the substitution of dangerous substances with less dangerous ones and the recovery and reuse of value from waste. This however, entails a safety hazard as well. New technologies often require new expertise, along with new or unusual working conditions and methods, or even health hazards. These must be duly taken into account from design to implementation. At the same time, such new technologies create new jobs, contributing to the reduction of unemployment rates. Education, training, the development of safety systems and briefing workers concerning their use, are among top priority issues. Identifying hitherto unknown effects of innovative new technologies, and making available the workforce required for them, are perhaps among the most important safety and security issues for the decades to come, in the various scenarios of green development.

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Smarter Cities and Public Security

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Abstract

The world's population boom is concentrated in urban areas. The explosive development of information and communication technologies may enable cities to answer the challenges like the migration pressure in Europe or the environmental issues and the growing demand for energy due to the increasing global population and GDP growth. The concept of Smarter Cities is about using technology to ensure sustainable economic, social development.

The Smart City Assessment methodology of IBM analyzes the city in 3 levels: mission and Vision; subsystems supporting the Citizens and the Enterprises (Public Safety, Education, Healthcare, Public Administration); infrastructure (Telecommunication, Energy and Utilities, Transportation).

Of the above subsystems the paper focuses on Public Safety. After highlighting some of the social and economic aspects of the topic, the Smarter Public Safety model of IBM is introduced. The model is built on the following five key competencies: access to relevant data; coordinated and integrated trusted information systems; enhanced situational awareness; proactive planning and intelligence based decision making; unified threat assessment and response capability.

As a result of the rapid development of infocommunication technologies agencies need to apply Big Data technologies to analyse high volume, unstructured data of different formats and uncertain origin and content. Cognitive computing introduced by IBM could result in breakthrough in this area.

Keywords: smart city, public security, global challenges, IT, cybercrime, sustainable development, law of Moore, IBM, Big Data, cognitive computing

Introduction

Accelerated progress of infocommunication technologies, expected to continue in the next decades, opens up new perspectives for our cities. The "smart city" approach intends to explore and leverage these opportunities. In the first introductory part, this study introduces the smart city concept from the point of view of IBM. In the second, more targeted part

described smart solutions employed in public security as part of the smart city concept, using examples and case studies, on the basis of international experience gained by IBM.

Challenges

In 2010, for the first time in history, more people lived in urban areas than in rural areas (UN, 2014). The pace of change is clearly indicated by the fact that the proportion of city dwellers was 30% in 1950 and forecasts predict that this figure will rise to 66% by 2050. One hundred years ago the number of cities with more than 1 million residents was less than 20. Today there are 450 cities on our planet in which the number of residents amounts to several millions (Dirks-Keeling, 2009). The extent of urbanization and its growth differ significantly from area to area. In 2014 in North-America, 82%, in Latin-America 80%, and in Europe 73% of the population lived in cities, while in Afrika and Asia the proportion of the urban population was 40% and 48% respectively, but that is where the rate of growth is the highest. By 2050, urban population is expected to rise to 56% and 64% respectively in these regions. The rural population of Earth is expected to shrink from 3.4 billion in 2014 to 3.2 billion and, as a result, the forecasted population growth of 2.5 billion will cause cities to grow even bigger, 90% of which will occur in Asia and Africa. Half of the urban population of Earth lives in settlements with less than 500 thousand residents, and every eighths city dweller lives in one of the megacities with more than 10 million residents (UN, 2014).

These demographic changes of unprecedented magnitude entail serious environmental, economic and social challenges (Pinter et al., 2013; Lados, 2015). For example, in China – based on a summary report published in *New York Times* in 2007 – only 1% of the country's urban population of 560 million people live in an environment where the quality of air is considered healthy according the standards of the European Union, and 500 million people do not have access to health and clean potable water (Kahn–Yardley, 2007). The energy industry giant BP forecasts that the global demand for power will rise further in the next 20 years owing to, in particular, the soaring demand in Asia. Despite the growing adoption of renewable energy, fossil energy carriers will account for 60% of the forecasted growth in energy consumption until 2035, and the proportion of their use will still be 80% (compared to 86% in 2004). Even though efficiency of energy use is improving and meaningful measures have been taken to reduce CO_2 emission, current trends indicate that between 2014 and 2035 emissions will further increase by 20%. This means that realizing the so-called IEA 450 scenario which defines a level of CO_2 emission that does not pose a risk of environmental disaster is seriously jeopardized today, and in order to adhere to it an unprecedented breakthrough would be needed in the area of energy efficiency and CO_2 emission reduction (BP Energy Outlook, 2016).

In Europe and Hungary, demographic trends show marked differences compared to the global ones, but at the same time we are not immune to the economic, social and environmental effects of changes, including security challenges, and we need to find ways to address them. Without going into detail, it is enough to refer to the pressure of migration on Europe (Borders 2020, 2012; Ryser, 2015), the political uncertainty in the immediate neighbourhood of the European Union, and the global environmental challenges (Pinter et al., 2013; Lados, 2015).

Smarter Planet and Smarter Cities initiatives by IBM

IBM's chairman, president and CEO, Samuel J. Palmisano, delivered a speech on 6th November 2008 at *The Council on Foreign Relations* in which he outlined a new initiative of the company called *Smarter Planet* (Palmisano, 2008) which aimed to leverage the most recent advances in information technology to address systemic social, environmental and economic issues, such as metropolitan traffic jams, responses to disaster situations, or the inefficient operation of the energy grid. Smarter Planet solutions can be described by their three characteristic features (marked by three "i"): *instrumented*, *interconnected*, and *intelligent*. IBM intends to respond to challenges related to social, environmental and economic sustainability with technical solutions that leverage the advances in technology to collect data captured by sensors, which are becoming cheaper and more ubiquitous (mobile phones, cameras, automated meteorological stations, instruments built into cars, etc.), using data transmission networks, which are becoming cheaper and more ubiquitous, to process them by using computing capacities and analysis methods, which are becoming cheaper and more ubiquitous, in order to resolve problems that could not have been resolved before (Horváthné Barsi – Lados, 2011; IBM Research Launches Project; Palmisano, 2008).

A high-profile element of the Smarter Planet framework program is *Smarter Cites*, which is specifically aimed at addressing urban challenges (Frost & Sullivan, 2014; Horváthné Barsi – Lados, 2011). In the past decade, IBM became a dominant global player in strategy making and business consultation as well as the development and implementation of relevant technologies, and, according to a number of leading analysts, IBM maintains its global leadership in these fields (Woods–Goldstein, 2014; Frost & Sullivan, 2014; Lados, 2015; Dirks–Keeling, 2009).

The Smart City model of IBM

IBM's Smart City model studies the operation of a city at three levels (Horváthné Barsi – Lados, 2011; Dirks et al., 2009):

- mission and vision of the city;
- services used by the residents of the city and the enterprises that operate there;
- infrastructure supporting the above levels.

City subsystems assigned to the individual levels, e.g. smart technologies available to the public safety subsystem, are not reviewed as standalone entities; rather, they are evaluated on the basis of whether or not they support achieving the strategic objectives of a city and how they serve the residents and local enterprises of the city.

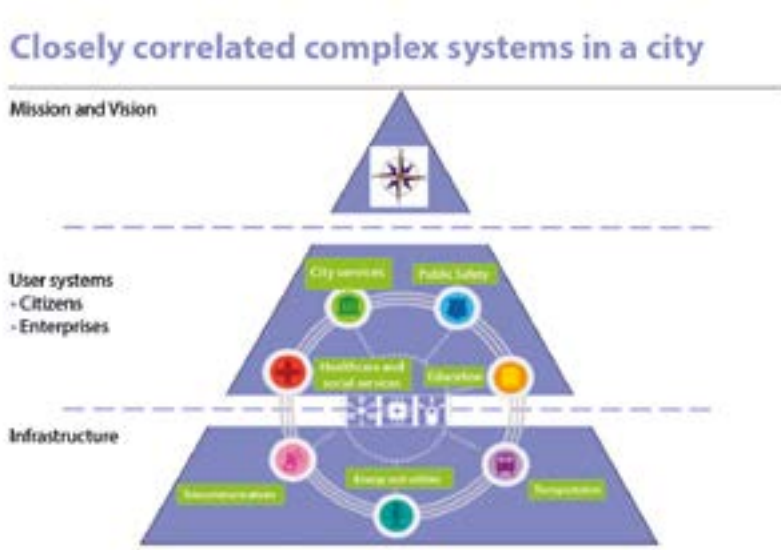

Figure 1
Smart City subsystems according to IBM's approach

Source: IBM Corporation

IBM's Smart City Assessment methodology can be used to create a survey of a city which evaluates the given settlement in terms of best practices and similar settlements. As a result of the survey, specific development and project proposals can be made. A simplified version of this methodology was used in a study of several Hungarian cities that was created in 2010 as a collaborative effort by IBM and the Hungarian Academy of Sciences (Horváthné Barsi – Lados, 2011). IBM can recommend complex solutions capable of supporting each of the subsystem of the above described city model, from strategic planning through technological implementation to operations support. The available extensive database of international comparative data allows for backtesting the results on an ongoing basis (Dirks et al., 2009). In the following chapter, we will examine public safety out of the several city subsystems.

Economic and social aspects of public security

The state of public security has a direct impact on the resident's well-being and quality of life, and on the decisions of businesses operating or planning to invest in the given area, and is closely related to economic performance. One of the most frequently used indicators to describe the state of public security is the number of detected crimes. Every act of crime has a social and economic cost that can also be expressed as an amount of money. In addition to direct material injury, this amount also includes e.g. lost revenues, damages to property as well as the costs of medical services provided to the victims, and the expenses incurred by the police, the judicial system and the penal institutions. A few examples:

- The amount incurred by each taxpayer in the form of crime related social costs was 3257 dollars on the average in the United States.
- The social cost of crime in the United Kingdom is 3000 pounds per household.
- In Brazil, damages directly attributable to crime are as high as 3–5% of the GDP, while in South-Africa this figure is 7.8%.

The real effects are probably much stronger as the measurements typically ignore costs that cannot be accounted for in an objective manner, and factors such as quality of life and psychological damages or pain, fear and sadness.

Figure 2

Social costs of crime in a few countries

Source: Keeling–Cleverley, 2012

Sense of safety is an important factor in almost all of the indicators that measure the quality of life. It is not surprising and it is easy to demonstrate that cities with a low crime rate are more attractive to people. In a knowledge-based society, the highly qualified and usually mobile tier of employees which actively seeks out cities offering high quality of life is of key importance for businesses.

Demographic changes that can be observed around the world, accelerating globalization, environmental challenges, and the accelerated development of infocommunication technologies entail a rise in crime and in the risk of attacks against the established social order. Organizations responsible for public security are facing new and complex challenges around the world. At the same time, popularity of infocommunication technologies may enable law enforcement bodies to upgrade their existing systems in order to identify patterns indicating crimes and forecast what crimes are likely to be committed and when, which, in turn, will allow them to implement appropriate preventive measures.

In regard to public security, IBM researchers identified the following five current trends:

1. Volume and significance of cross-border crime is increasing.
2. Risk of terror attacks and environmental disasters is rising.
3. The explosively increasing volumes of digital data must be tackled.
4. Cooperation between various national and international organizations is impeded by the lack of interconnectedness between applied information technology systems, and a lot of records are still unavailable in digital formats.
5. Prison populations are on the rise globally and the high rate of repeat offenders presents a serious challenge.
6. Law enforcement budgets typically either fail to rise in proportion to the increasing challenges or they are even cut back. However, to an increasing extent they are still expected to justify expenditures with measurable results. (Keeling–Cleverley, 2012).

Smarter public safety systems

A critical aspect of the application of information technology is the collection, processing and sharing of data generated at various organizational units and organizations. The volume and diversity of data produced is growing exponentially from year to year. The smaller part of the available data volume consists of so-called structured, comparable and verified data that can be arranged into standard tables and processed efficiently by conventional database management systems. The larger part of digitally available data is made up of so-called unstructured data (images, videos, e-mail, social media posts) which lack a standardized structure, and are much less interpretable for computers, not to mention that typically their authenticity is uncertain. Law enforcement agencies traditionally relied on structured databases in the first place, but the ability to process unstructured data that are produced at a frantic rate in ever greater volumes – the so-called *big data* analysis – has been given priority recently. As Dr. Richard Jankowski, a researcher at the University of Memphis has it: *"...We can't look at someone's head and their genes and say they're going to commit a crime. But can we forecast what's going to happen and where it's going to happen? Yes, we can."* There are a lot of different data based analysis methods, from charting the distribution of the individual crime categories in time and space and doing a statistical examination of influence factors to visualization of the studied persons' network of relationships. Obviously infocommunication technologies will continue to play a key role in areas of application that support administrative functions and are regarded by now as conventional, including crime record management supported by integrated document management systems or master data management solutions that can be used to integrate various isolated systems in order to extract information in a consistent and standardized format. Beyond the above mentioned examples, there are a number of other areas of applications. (Cotton, 2012).

Figure 1: Information Management and Analytic Applications in Law Enforcement

Management and Operational Functions		Information Management and Analytic Applications
Resource Planning and Optimization	Personnel Deployment	Understand crime patterns to optimize enforcement officer scheduling, ensuring an appropriate staffing level during peak, normal, and light demand period
	Risk-Based Deployment	Identify locations linked to specific types of crimes, and proactively deploy tactical resources to respond quickly or prevent crimes
Detecting, Solving and Predicting Crimes	Tactical Crime Analysis	Model a crime and series of crimes, build links to other cases, identify and apprehend suspects, prevent future crimes
	Behavioral Analysis of Violent Crime	Model behaviors and predictors of violent crime, identify at-risk individuals and current suspects; use the results in detecting, solving and preventing crimes, and in risk-based deployment
Enhancing Situational Awareness	Risk and Threat Assessment	Identify and characterize events and factors linked with increased levels of threat and risk; use as inputs for deployment, special operations, forecasting, and prediction
	Officer Safety	Understand the interaction of factors on creating unsafe environments for officers and better prepare the officers deployed
	Around-the-Clock Crime Analysis	Update crime monitoring and prediction models based on a regular flow of new data to improve command decision-making and response capabilities

Source: Frost & Sullivan Analysis

Figure 3

Categorization of information technology solutions supporting public security

Source: Keeling–Cleverley, 2012

IBM's Smarter Public Safety model (Cotton, 2012; Keeling–Cleverley, 2012)

1. Building on experience gained by cooperating with a lot of law enforcement agencies around the world, IBM created the *Smarter Public Safety* model. This model is built around five key elements:
2. Integrated, reliable and standardized operative information system.
3. Efficient and effective tactical response capability.
4. Pro-active planning and decision making.
5. Optimization of collaboration between various organizations, standardized interpretation of threats and uniform responses to them.

Secure access to a wide range of relevant data

Secure digital access to as wide a range of data as possible increases the effectiveness of law enforcement agencies. The first step is to provide electronic access to data that have not been stored digitally, such as written records made at the scene, investigation reports, arrest records, and fingerprints. Conventional databases can be created from sources such as voice and video recordings and other information stored on social media sites or available on the internet. It is important to monitor and improve the quality of data based on criteria such as consistency or the limitations of the storage format (e.g. resolution of images and videos). Other elements of the model are built on securely accessible core systems that retrieve data from a wide range of regularly maintained, standardized and reliable data sources (Keeling-Cleverley, 2012).

Case study: Ministry of Justice of the United Kingdom

One of the key objectives of the Ministry of Justice of the United Kingdom is to forecast criminal behaviour. High volumes of data must be quickly, accurately and efficiently processed to ensure that crimes can be prevented with a high probability. The ministry came to the conclusion that analyzing data about perpetrators that used to be stored in isolated databases in a standardized system is indispensable for having a more comprehensive view of them. As part of this program 4 million records related to incarcerated persons have been processed, including information such as the emotional profile and alcohol and drug consumption habits of these individuals. A standardized system was used to analyze the data and to create forecasts as to what risks of future problems could be detected using statistical methods applied to the individual convicts. The results were used to introduce more efficient crime prevention programs in prisons. As a result of the program, the accuracy of forecasts related to repeat offences improved by close to 10% in the case of violent crimes, while predictions related to other crimes improved by 4%. Based on the processed data it was possible to have a better understanding of what kind of treatment in prison has the greatest chance to reduce the risk of repeat offences.

"With almost 4 million records on file, it simply wouldn't be feasible to trawl through this manually... technology gives us valuable insight into offender data, helping us predict who may reoffend and enabling us to advise on preventive measures." said the spokesperson of the Ministry of Justice of the United Kingdom (Keeling–Cleverley, 2012).

Integrated, reliable and standardized operative information system

The second element of the model focuses on accessing information sources available within a given organization through a standardized system. Typically, organizations use multiple information silos that are implemented independently of each other. Data items are recorded in several system, which inevitably leads to inconsistencies that should be eliminated. In addition to consistency, another important aspect is that these data should be presented to the user in the most useful and comprehensible format so they may support decision making

as directly as possible. Proper visualization helps greatly the practical use of information in all areas of police operations, from detectives through crime analysts to police leaders. Integration of former insular systems even allows for setting up a network of collaborating experts to support the work of emergency response teams in real time by processing information from multiple sources according to various criteria in order to provide assistance with rapid on-site responses and prompt decision making (Keeling–Cleverley, 2012).

Case study: Madrid

Looking to improve emergency response capabilities and to better protect its residents, the city set up an advanced emergency control centre *(Centro Integrado de Seguridad y Emergencias de Madrid, CISEM)* in the aftermath of the bomb attacks against trains in 2004. CISEM collects and processes data from the widest possible variety of data sources. This includes, among other things, conventional police databases, reports from citizens, data from video surveillance systems and traffic control, and many other data sources. Various organizations use the system to share their devices with each other and they use standard protocols in order to improve collaboration and to respond more quickly and successfully to emergencies. Using standardized and holistic real-time information about incidents, commanders have a better insight into how complex emergency situation affect the city as a whole. In this way they can evaluate the situation at hand more quickly and accurately, and are able to provide better responses. It also gave a boost to the review of requirements, the prioritization of measures that are to be taken, and the coordination of interventions. The time it takes to respond to emergencies was reduced by 25% thanks to the implementation of this system.

"The most innovative aspect of the center is its scope – the integration of all the people involved and the systems they use.", said Fernando Garcia Ruiz, Head of Innovation and Development, Department of Security, City of Madrid (Keeling–Cleverley, 2012).

Efficient and effective tactical response capability

The basic idea behind the third element of the model is to provide response teams in situations requiring police, firefighter, disaster management or medical intervention access to the widest possible range of information that help them complete the given task in the field. This means centralized, highly automated mission management systems that assist the response personnel by providing them with situation-dependent information, track the parameters of the crew and the mission environment, and send situation-dependent alerts about changes through mobile devices. Collaboration between various organization is of utmost important in this field too (Keeling–Cleverley, 2012).

Case study: Madison County, State of Mississippi, United States of America

Rapid growth of the county prompted the sheriff's department to implement a centralized and automated system that, in addition to monitoring police activities all the time, speeds up

the sharing of data and sends out warnings if necessary. Once the new system is deployed, policemen will use laptops to connected to each other and to the central database of the police station that will also provide pro-active functionality. Thanks to these development efforts, policemen will have real-time access to critical information and documents such as alerts related to accidents and incidents as well as subpoenas and court orders. As the system is accessible from everywhere, policemen will be able to perform assignments such as identification of victims and suspects and apprehension of suspects much faster. The system monitors the policemen's location all the time, which makes it easier to provide assistance to them if necessary. Policemen can record reports and notices in the field, which allows them to spend more time on the streets, improving the community's sense of security and deterring criminals.

"Real-time data.....makes critical decision making easier for all officers — immediately. That's a law enforcement tool we've never had before."— Mary Rooney-Lucas, President, DCS, Inc.

Pro-active planning and decision making

The work of detectives and crime analysts essentially involves combing through huge volumes of seemingly unrelated data to find clues that may lead to the solution of the give case. Advanced data analysis tools may help them recognize hidden correlations. This is especially useful, for example, in the investigation of international cybercrimes. In addition to using analytical tools to identify perpetrators, they can also be used for risk assessments so that crime may be prevented in time. In addition to preventing crime, risk assessment may also help prevent various emergency situations. These tools can be used to speed up the sending of alerts, reduce response times, improve the efficiency of assigning response teams to various tasks, and provide them with information to support decision making (Keeling–Cleverley, 2012).

Case study: Addison Lee

Addison Lee operates the largest minicab fleet in Europe, processing more than 25 thousand bookings a day. In cases where the fair is paid with a stolen credit card, the company may face losses up to one and the half times the value of the ride. The company is forced to refund the sum debited from the stolen card to the bank while it is also obliged to pay the driver's commission. In order to combat such abuses of the service, the company created a database of fraud cases, and used advanced analysis tools to identify high-risk passengers. They developed a system that they were able to use to catch fraudsters as soon as they booked a cab, based on automated warnings. As a result of this project, abuse of the service was reduced from 5 to 10% to less than 1% of the bookings, whereas the monthly amount refunded to banks was reduced by more than 95%.

"...gave us real-time protection against fraud, as we were able to run incoming requests against our own intelligence in our existing fraud database and receive automatic alerts on any matches.", said Mark Willson, Fraud Control Manager for Addison Lee, summing up

the key achievement of the project. Optimization of collaboration between various organizations, standardized interpretation of threats, and uniform responses (Keeling–Cleverley, 2012)

The fifth and final element of the model is the coordinated, combined use or integration of the other four elements/four competences. Efficiency and effectiveness of the work carried out by various law enforcement agencies and the related public, private and civil organizations can be improved significantly through uniform coordination and information sharing measures. This is especially applicable to the assessment of risks posed by various disasters and emergencies and to the forecasting of incidents. An integrated and intelligent control centre can provide a uniform and real-time view of all known aspects of a given emergency, and enables a coordinated approach to managing the work of the deployed response forces, for example, firefighters, disaster management teams, police, ambulance, and local governments.

Case study: Smart control centre in Rio de Janeiro

The Olympic Games and the FIFA World Cup were hosted by Rio de Janeiro in 2016 and 2014 respectively, while the metropolis which is home to 6.5 million residents and is surrounded by a suburb with 12 million people faced several emergencies in the not so distant past. The Rio Control Centre was commissioned at the end of 2010 in the city – its mission is to coordinate the work of all involved organizations, collect data from various sources (e.g. meteorological, traffic, healthcare, crime, city infrastructure related sources, etc.) and track and visualize the current public safety situation. The control centre processes information from 30 different organizations. The result is a comprehensive view of the actual state of the city, which supports prompt coordinated interventions, analysis of trends, creation of forecasts and implementation of preventive measures in Rio in areas of city operations such as traffic management and prevention of traffic jams, crime investigation and prevention, or the ensuring of the uninterrupted operation of critical infrastructure elements, for example, the electric grid and the water supply. The centre is also tasked with managing the organization of major events such as the above mentioned World Cup or the Olympic Games. Based on constantly collected information, the centre keeps improving its prediction models and emergency response capabilities. The system can use various mobile communication channels to keep the emergency response units as well as the involved citizens updated, depending on the location and the situation. In the city, it is particularly important to prevent emergency situations and damages caused by flood and landslides in the aftermath of heavy rainfalls. In case of emergency, the system can send early bulk alerts to e.g. mobile phones. The centre also streamlines and accelerates information exchange between various organizations, and reduces the time needed to get a grasp on the essential circumstances of the emergency and take response measures as necessary from days to hours.

“In Rio de Janeiro, we are applying technology to benefit the population...so as to empower them with initiatives that can contribute to an improved flow of city operations.”, said Eduardo Paes, Mayor of Rio de Janeiro.

Interdependent elements of IBM's Smarter Public Safety model

Certain elements and competences in IBM's *Smarter Public Safety* model form an interdependent, hierarchical system (Cotton, 2012).

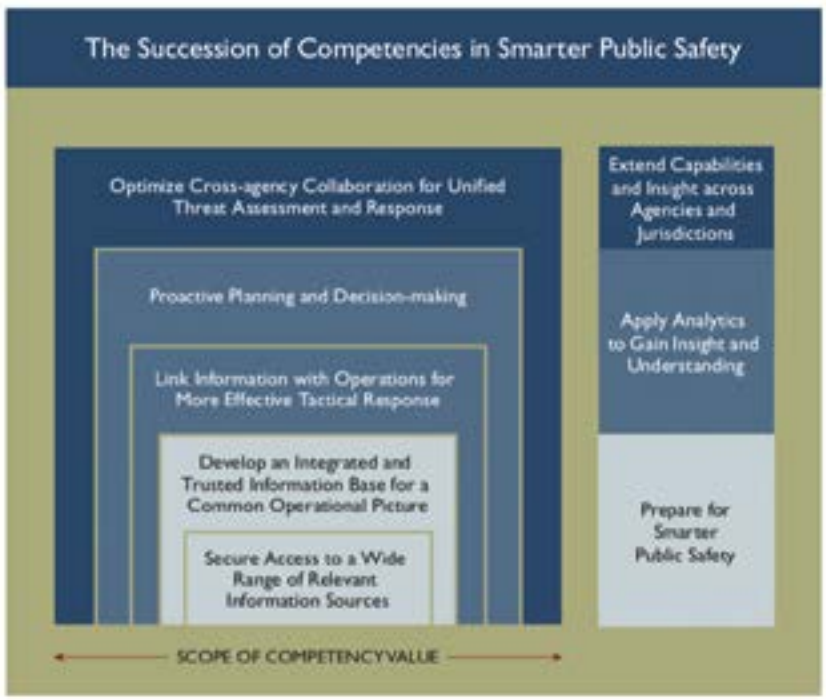

Figure 4
Interdependent elements of IBM's Smarter Public Safety model
Source: IBM, Frost & Sullivan analysys

Foundations – Prepare for Smarter Public Safety

Collecting available structured and unstructured data and making them accessible in digital format constitute the foundations of the system. These functions allow for answering questions like "who", "what", "when", and "where" in relation to crimes. Data should be retrieved from the widest possible range of sources, including data sources outside the organization, which means cooperating peer organizations or social media sites and the internet in general. The next step is to use these various data sources to create a central information system with standardized, reliable and suitable access control solutions and defences, which will serve as the basis of uniform operative management and analysis processes.

Apply Analytics to Gain Insight and Understanding

When uniform, reliable and secure data sources based on an extensive pool of information are available, the use of the statistical analysis tools that constitute the core of the *Smarter Public Safety* model may commence. Correlations revealed by these analytical tools make it easier to answer the questions of "how" and "why" in regard to crime. What is even more important is that by a statistical analysis of huge volumes of data not only analysis reports used for decision support can be created, but thanks to the prediction and risk assessment techniques crimes may even be prevented (*NYPD changes..., 2006; Putting a new byte..., 2006*).

Extend Capabilities and Insight across Agencies and Jurisdictions

The international character and complexity of threats against public security (international crime, terrorism, cybercrime, weather-related emergencies, natural disasters, etc.) makes cooperation between various organizations within and between countries essential. This has also to be supported by the implemented information systems. Sharing of information in a mutually comprehensible and quickly usable format, and coordination or even uniform management of resources and operative measures can also be of vital importance.

Public security reference model of IBM

Solutions developed by IBM form a modular system, the components of which can be used as standalone units or as part of a uniform integrated system, depending on user requirements and capabilities (Cotton, 2012).

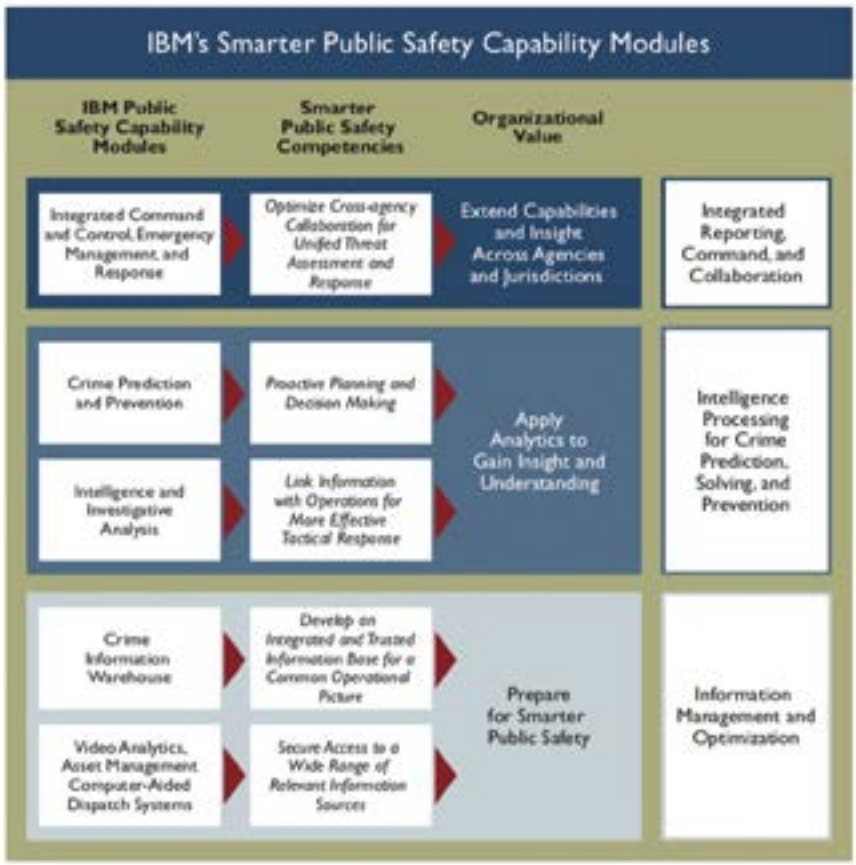

Figure 5

IBM's Smarter Public Safety Capability Modules

Source: IBM, Frost & Sullivan analysys

Big Data and cognitive computing

Data analysis solutions capable of processing huge volumes of unstructured data play a central role in the previously described model. IBM plays a leading role in resolving the so-called big data problems, and was the first to introduce the so-called cognitive computing (Kelly, 2015). In the following section, we will discuss a few important information technology trends that are relevant to our topic.

In 1965, a chemist, Gordon Moore, who was barely known at the time, published a study about relevant issues related to the electronics industry in the *American Journal of Electronics Magazine*. In the past 50 years, Moore's empirical law became a symbol of the explosive growth of infocommunication technology (Moore's law). As a result of this rapid growth, the speed and energy consumption of electronic processors, the capacity of memory

circuits, and the area of image processing and data transmission often saw progress the rate of which was in the range of billions. One of the leading chip manufacturers, Intel, released a publication on the 50th anniversary of the publication of Moore's law, in which excellent examples are cited to demonstrate the incredible progress of information technology. One of those examples claimed that "if house prices fell at the same rate as transistors, a person could purchase a home for the price of a piece of candy". Another expressive example was that in 1969 the voyage to the moon took 3 days. If the speed of spaceships grew at the same rate as the speed of computers, that trip would now take one minute.

From the 1960s to the first years of the 1980s, users accessed large central computers using so-called *mainframe* terminals. This system was replaced by personal computers and the so-called client-server architecture, which was complemented by personal computers getting connected *en masse* to the Internet starting from the 1990s. By now personal computers have been dethroned as the dominant end-user platform by mobile devices such as smart phones and tablets. In the nearest future, machine-to-machine communication, the so-called *"Internet of Things"* (IoT) is expected to start its conquest in earnest (Komáromi, 2012). Soon the masses of people will start using wearable Internet-enabled devices, and the popularity of virtual and extended reality is also expected to go through the roof soon. With the spreading of mobile devices, infocommunication technology affects the lifestyle of billions of people. According to the *GSMA Global Mobile Economy Report*, by the end of 2014 the number of mobile subscribers reached 3.6 billion on Earth. This means that while 10 years ago the fifth of Earth's population had a mobile subscription, today this figure is 50%, and 1 billion more subscribers are expected before 2020, raising the global mobile penetration to 60%. The number of data connections entered the range of billions in 2014 and the number of so-called *machine to machine* connections exceeded 240 million.

Before IBM's personal computer made its debut in 1981, a couple of million users used a couple of thousands of software applications. The age of PC made tens of thousands of applications available to a few tens of millions of people. This mobile age represents another leap in magnitude: billions of users have access to millions of applications (Dirks et al., 2009).

The increasing popularity of mobile devices was mirrored by the spreading of a technological and business model called *cloud computing*, which reduced per-user IT costs to a fraction of what they were before, and as a result, software solutions that used to belong to the exclusive domain of large corporations and governments became available practically to everybody in the developed country, to many even in the developing regions.

Thanks to cloud-based computing and the evolving software development technologies – including, for example, the use of so-called APIs *(Application Programming Interfaces)* – that enabled developers to build software applications quickly from reusable and shareable building blocks, the cost and time spent on developing new applications and placing them on the global market were reduced by orders of magnitude. An important consequence of the spreading of mobile and cloud-based technologies was the popularity of social media that gave the world new ways to acquire and share information.

Due to the outlined changes, an unprecedented volume of digital data is produced every day, more than 80% of which is so-called unstructured data (Unstructured Data…, 2008), i.e. sound, image or e-mail. The steadily evolving big data analysis addresses the processing of unstructured data generated in huge volumes that the conventional database

are incapable of handling. Compared to data analysis tasks that can be completed using conventional tools, problems posed by Big Data have usually 4 distinct characteristics *(The four V's of Big Data...)*:

1. *Volume:* Compared to what was considered mainstream a few years ago, the amount of data available today is greater by orders of magnitude. It is quite enough to recall the images, messages and social media posts produced by billions of smartphones. The growing data volume allows for building more accurate statistical models.
2. *Variety:* Tables and structured databases processed in a standard format that were used in the past now represent only a fraction of the available data. Most of the digital data sources are so-called unstructured data that are difficult to interpret using conventional tools: e-mail, text messages, images, videos, sound recordings, blog and other social media posts. IBM is a leader in the development of solutions that are capable of processing unstructured data. In addition to the popular SPSS data analysis tools, these include IBM's so-called cognitive Watson solutions which are capable of interpreting text written or read in a natural human language and processing images.
3. *Velocity:* Often there is very little time to collect, process, and interpret data, and to provide the correct response if the goal is to take immediate action rather than perform a follow-up analysis. For example, a traffic situation, a cyberattack or some other emergency may require an automated response, sometimes within a fraction of a second.
4. *Veracity:* Often the massive amounts of available digital data can be traced back to an unverified source of uncertain origin. Finding out how reliable the information obtained from these sources is could be the greatest challenge ever. The cognitive systems that we will describe in a bit more detail later can handle the uncertainty associated with data sources and even indicate the probability of accuracy of conclusions drawn by using advanced statistical methods.

IBM believes that in our days we reached another milestone in the development of computing, and we are on the threshold of the so-called cognitive era (Kelly, 2015). The paradigm shift is a result of the change in the way the data is processed. The first electronic computers were able to perform basic mathematical operations at high speeds. The next level, the era of programmable computers that we are still living in, is when computers run clearly defined programs and execute predefined instructions if certain pre-programmed conditions are met. In contrast, cognitive systems can also learn (machine learning) and modify their behaviour according to their "experiences". Cognitive computing system can also understand natural human speech and they also address the problems arising from the veracity or inadequacy of the available information. The first cognitive computing systems in the world were built by IBM, and named Watson after the founder of the company. The system made its debut in a quiz show called "Jeopardy!", which is popular in the United States, and won against two of the most successful previous winners of the show. During the show, Watson was not connected to the Internet, rather it stored in its memory 200 million pages of structured and unstructured data, including the entire Wikipedia.

By now IBM set up a dedicated business division to find business cases for cognitive computing, and repositioned its strategy around the new era of computing. The first large-scale commercial application was an oncology diagnostics systems, *IBM Watson for*

Oncology, that was developed in collaboration with researchers from renowned clinics and is capable of processing hundreds of thousands of medical articles, and it can deliver a highly accurate diagnosis based on the available clinical findings and other information and recommend therapies in cancer cases. Creating a global innovation ecosystem, IBM made its cognitive computing systems available to third-party developers.

Organizations responsible for public security should also adapt to the changes in the technological environment. The emergence of new technologies, tools, and information sources creates an opportunity for law enforcement to operate in a better organized and more efficient way, but it also carries risks as these technologies and tools and, in part, the information sources themselves are becoming more accessible to criminals from day to day.

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III.

INTERDISCIPLINARY RESPONSES

Péter Dely

Combating Terrorism in the Western World: Is it Warfare or Law Enforcement?

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Abstract

The essay deals with the definition of terrorism, highlighting the criteria of terrorism and examining who can be called a terrorist. It compares terrorism with guerrilla warfare. The paper also provides examples for the different theories, while also focusing on the possible government reactions. With the help of statistical data, it delineates the possible ways of eliminating terrorist groups. Based on historical examples, the paper offers recommendations to change the current system, especially in the field of use of force, and counter-terrorist operations.

Keywords: terrorism, guerrilla warfare, law enforcement, use of force, counter terrorism, military operations, community policing

Introduction[1]

The fact that the battle against terrorism is a fundamental interest of every democratic state, does not, I think, need to be proved. If we want to see how the state can respond to terrorism, we first have to define the concept itself. While many have tried to find numerous ways to define it, there is currently no fundamental description of what we mean by the word terrorism, and most of all who we consider to be a terrorist. Alex P. Schmid: *Routledge Handbook of Terrorism Research* (Schmid, 2011) presents 250 different definitions. Almost all of these definitions have the following characteristics: terrorism is mostly directed against non-combatants; commits crime and violence against society; politically motivated, and thus refers to religious and other ideological goals. However, if we want to use law enforcement agencies in a state based on the rule of law to fight terrorism, a legal category is also needed.

[1] Here I wish to emphasize the difference in terminology in the English language which is non-existent in Hungarian. Counter Terrorism: the intelligence gathering on and averting of terrorism, that is, the national security aspect dominates, while Anti-Terrorism: the physical, armed struggle or operation itself. In this paper, in most cases I use counter-terrorism in the sense of operational activities falling under anti-terrorism.

In Hungary, Act C of 2012 on the Criminal Code defines the concept of terrorism in Section 314. When clarifying the political and legal category, it is also important to mention that a person who can be linked to terrorism is not the same as the legal and criminal category of a person suspected of perpetrating an act of terror.

Wars, guerrillas, terrorists

Attila Ágh, in his book entitled *Conflicts and Wars* (Ágh, 1989: 186.) mentions several types of war and conflict. Of these, let us take a look at what he says about the destabilization war: "The type of local war in which the focus has already shifted towards the non-military means and goals of the conflict is called a destabilization war... The main effort is no longer aimed at the direct military defeat of the opponent, but at exhausting him in a protracted conflict and to force its collapse by all possible means."

Terrorism is a war activity following the logic of asymmetric warfare. The declared strategy of the present-day groups that we consider to be terrorist groups, that of the Muslim religious groups, in particular, is the same as the objectives of destabilization wars. Whether someone counts as a terrorist, or a group counts as a terrorist organization, is not a result of a system of criteria based on a scientific criterion, but a decision by the political leadership of the states concerned.

We can definitely and with certainty declare that perpetrators of terrorist acts are waging war on the party attacked. If we consider the clearest wording of the interpretation of war, according to which "war is an act of violence to compel our opponent to fulfil our will" (Clausewitz, 2013: 39.), then there is no question that terrorism is war, fighting which is a military task.

Possible operational counter-measures

There is no problem in the interpretation of terrorism in the crisis management mission areas of NATO and EU member states, which is considered as combat operations and is countered with counter-insurgency operations. The situation is different with regard to terrorist acts committed in the territory of European countries.

With regard to recent events in Paris, Brussels, London and Boston, terrorism was considered a criminal category, and consequently the state can only respond to them in accordance with the rules of its own criminal law and criminal procedural law. The problem arises in the perpetration of violent, often suicide attacks aimed at taking the life of the victims. During such operations, the average police response, based on the experiences of recent events, is inadequate and ineffective.

If we consider all these operations to be those of an existing terrorist organization, then it follows logically that terrorist acts in Western countries fit into the category of destabilization warfare, only the theatre of war is shifted. Nowadays, it is a trend that perpetrators of terrorist acts are individuals who are not in personal contact with the terrorist organizations, often they do not receive any material support from them, only ideological guidance. The

term "proxy war" equally fits the acts committed by these people just as it fits the operations of insurgent groups supported by the great powers.

The use of force

Nowadays, the operational and professional dilemma is becoming more and more prevalent that the operations of the police units determined by the legal framework fall short of the desired result, and the effective solution of the military special units is contrary to the legal regulation.

At the same time, international trends, in particular in recent developments, show that Europe is drifting towards a military response. Both in Hungary and in the EU countries there is strict control over the use of service firearms by the police. Although there are differences, but in general it can be said that the relevant regulations allow only aimed single shots at the person against whom the legal criteria of the use of deadly force are met.

Nevertheless, during a recent police operation in France, for example, when the authorities tried to arrest an individual named Merah (suspected of committing terrorist acts) (Index, 2015), approximately 5,000 shots were fired, and this is against the French police regulations. Tactical techniques used in military combat, such as suppressive fire, are inadmissible in the spirit of the law during the use of police service firearms, but effective tactics of counter-terrorism require their application.

All European countries have modern counter-terrorism SWAT teams equipped and trained to meet the requirements of the age, which typically operate as part of the police. However, if it is about a pre-planned operation based on intelligence (such as the arrest in Paris mentioned above), first response police units not specially trained/equipped get involved in a combat engagement with terrorists. Another problem to be mentioned is the fact the tactical techniques of the police and counter-terrorist units are based on the Christian European approach, namely the assumption that people do not usually want to die, they choose to surrender in a hopeless, unequal situation. As a result, many police methods, primarily designed to protect human life, are ineffective against the fundamentalist terrorist prepared for suicide martyrdom, the only and effective solution is the immediate and accurate use of force.

In 2008, the RAND Corporation published a study on the disappearance and liquidation of terrorist groups, in which 648 terrorist groups between 1968 and 2006 were analyzed. According to their findings, 244 groups are currently active, 136 have ceased to exist on their own. Out of the remaining 268 groups, 27 were victorious, 20 were liquidated by using military forces, 107 groups were liquidated by police forces, 114 groups were transformed into political movements (Jones–Libicki, 2008).

Reading these figures, we can definitely say that the police methods have been successful. However, if we look at the numbers in detail, we can make the following statements. Out of the 107 groups wiped out by police, there were 47 extreme leftist organizations with a membership of a couple of tens of individuals, maximum 100 individuals. 38 of them were active in the 1970's and 1980's. 14 groups were extremist right-wing organizations, and only three operated after the millennium. 33 terrorist groups were based on nationalist ideologies,

of which only 7 were established in the early 2000s, the rest were active earlier. There were altogether 14 religiously motivated groups, and only 3 were formed after the millennium.[2]

It is even more interesting to analyze groups with a membership of more than 1000 and 10 thousand individuals separately. At the closing date of the study, 49 terrorist groups with 1,000 members and 13 groups with more than 10,000 members were recorded. 16 groups with 1,000 members and 16 groups with 10,000 members have become political movements. 7 terrorist groups with 1,000 members and 6 groups with 10,000 members were victorious. Three groups with 1,000 members and 2 groups of 10,000 were disbanded on their own. 6 terrorist groups with 1,000 members and 1 group with 10,000 members were liquidated by military means. There were 1 group each that were liquidated with policing means. In the case of groups with a larger mass base, therefore, the failure of the police solution becomes apparent and the military and political solutions will come to the fore.

Even more shocking is the analysis of data if we want to draw a parallel between past events and the current fight, that is the fight against the Islamic State. During the period under review, a single terrorist group with a mass base of more than 1000 people was organized on a religious basis, whose declared aim was to overthrow the prevailing system and set up a new social model on a religious basis. This was the Algerian "Armed Islamic Group", which operated between 1995 and 2000 and was ultimately eliminated by military means (Jones–Libicki, 2008).

Is there a solution?

As can be clearly seen from the foregoing, a community policing model so successful in everyday life is ineffective against the terrorism of the 21st century. It may, however, be worthwhile to observe the methods of countries where police forces are exclusively responsible for countering terrorism. Such an example could be the subdual of the Sikh uprising in Punjab, India between 1980 and 1994 and the related terrorist acts. Police Major General Kanwar Pal Singh Gill was appointed head of the counter-insurgency operations in 1988. Upon assuming the assignment, General Gill declared that since terrorism and insurgency are not a law enforcement problem, but a form of war, so ordinary law enforcement techniques are insufficient to deal with the problem. There is a need to reformulate the rules of "use of force"[3]: it cannot be used only in the ultimate case, striving after minimal use of force. In his view, the use of force must be proportionate to the threat, and it is necessary to approach this method when it produces effective results. It is important that the armed units and the logistic support base of the movement or terrorist organization should be destroyed or made inoperative at a rate that exceeds its regenerative capacity. At the same time, he also stated that this was only possible with strong political support. If politics are about to make concessions or initiate negotiations with the terrorist group, it means the beginning of the road to defeat.

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[2] As the study was prepared in 2008, the Islamic State and several successors of the Al-Qaeda are not included in the analysis.

[3] *Use of force:* in English terminology: "use of service firearms"

As a result, a number of amendments to the law were introduced. The first and, in my view, the most incompatible one with European democratic principles, is the amendment of the National Security Act that suspended many restrictions on the operation of law enforcement agencies and allowed detention up to two years without judicial decisions, that is, even in the absence of evidence of the confirmed perpetration of criminal acts. They also alleviated the rules of the use of deadly force (service firearms) by law enforcement agencies and have created a separate apparatus and organisation for combating terrorism (Resperger et al., 2013).

In Hungary, Act CXXV of 1995 on the National Security Services and Act XXXIV of 1994 on the Police also provide for combating terrorism. They both designate several organizations in the area of intelligence and internal security, but only the general police service has investigative powers. It is worth noting that the Police Act refers back to the National Security Services Act in relation to a counter-terrorist organization and authorizes research and screening work on the basis of authorizations included in this law. Thus, there is a duality in the activities of the Counter-Terrorism Centre: it is authorized to act both as a police unit and a national security service. The problem is with the police operations that may be involved in the fight against terrorism, which is subject to the use of force. In these cases, the relevant regulation is the same as the one for the community policing police model, which is described in the Police Act.

In my view, therefore, it may be worthwhile to consider amendment of the rules of "use of force" (use of force cannot be authorized as the ultimate action, minimal use of force should not be pursued), as well as the complete separation of counter-terrorism from the community policing model. However, this regulation can only be implemented against really aggressive terrorists who are committed to the perpetration of violent crimes against life. This raises two problems. On the one hand, it is not expected from a highly trained counter-terrorist unit to operate under double standards, that is to say, according to civilian police regulations on one occasion and according to regulations on counter-terrorism on another. In other words, it is not fortunate to use a police officer trained for the fight against terror in a community policing role. The other problem is that even the criminal law definition of terrorism is too broad, so it allows us to see a person as a terrorist who did not intend to commit or aid a crime against life. It is natural that in the fight against terrorism it is equally important to detect and eliminate funding and the propaganda background, but not necessarily with the most serious and most violent methods.

Conclusion

Overall, we can say that domestic counter-terrorism activities (both in Hungary and in the EU) are ripe for a paradigm shift. New equipment, techniques, training methods and new legislation allowing this to happen are needed. The separation of the community police and counter-terrorism in both organizational and regulatory areas will become indispensable. The starting point for the changes should be research done to academic standards and based on the analysis of facts and events, also using the theoretical knowledge of the military sciences. Following the counter-insurgency and counter-terrorism strategies set up by David Galula, but later hallmarked by General Petraeus, a military-based anti-terrorist strategy

based on military principles must be established before some regions in the European Union become crisis zones themselves.

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Péter Balogh

New Millennium – Emerging Challenge? Empirical Analysis of the Global Terrorism Operative Cooperation Network

"certain connections may develop between the previously separate types of terrorism"
(Haskó, 2002: 24.)

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Abstract

In this paper, our aim is to empirically explore the emergence and the challenge of terrorist actions realized in cooperation by multiple organizations in the new millennium. We analyze the development of collaboration among terrorist groups describing the trans-regional network constituted by cooperative attacks. We demonstrate the desirable outcomes of partnership for the terrorist organizations concerned and highlight how collaborative terrorist actions have become a major threat for the wider social sphere. In our research, we carry out secondary analysis of statistical data. In the process of data analysis we employ mainly descriptive and some other statistical methods. Furthermore, we apply basic social network analysis tools. According to our preliminary results, terrorism in the new millennium has become globally embedded through cooperative terrorist attacks. This international terrorist network is segmented regionally and certain actors gain greater importance in the structure than others; however, cooperation proves to be advantageous for the terrorist groups concerned.

Keywords: terrorism, cooperation, network embeddedness, empirical research, social network analysis

The problem

Parallel with the cross-border flows of the new millennium, integrating the world into an inter-connected system (Rostoványi, 2002: 72.), to a major extent owing to the information logistics and replacement system covering more than one continent (Józsa, 2002: 100.),

security and terrorism also took a new term (Haskó, 2002: 14–15.). A global space (Kiss, 2002: 39.) and global threats (Rostoványi, 2002: 77.) were developing, in which the challenge caused by the cross-border terrorist networks (Kiss, 2002: 40.) became greater and greater. A threat emerged spreading in all directions globally and cannot be associated with a particular territory (Kiss, 2002: 47.). Besides the spread of conflicts (Kiss, 2002: 42.) it also meant that they became interconnected through the cooperation of terrorist organizations and social actors (Kiss, 2002: 42.), i.e., on the basis of the transnational relations between terrorist organizations, the terrorist actions also became international (Rostoványi, 2002: 80.). A global anti-terrorist coalition (Kiss, 2002: 44.) was formed to combat this transnational form of terrorism (Rostoványi, 2002: 80.) and the internationalization of terrorist organizations (N. Rózsa, 2002: 270.), so a community of states confronts the network of the terrorist organizations (Rostoványi, 2002: 82.).

In the framework of our research outlined in this study, we search empirical answers (1) to the occurrence and spread of operative terrorist actions performed in cooperation.[1] We intend to (2) explore the network structure of the trans-regional integration of terrorism through multi-actor terrorist cooperation (Granovetter, 2006), identify the main actors in this global market of terrorism (Tálas, 2006: 8.) and the role of the weak bridging connections in macro-level integration (Granovetter, 1991). We shall also refer to the effectiveness of such cooperative terrorist actions (3) and, in relation to them, their hazards.

Methodological outline

Our research is based on the secondary analysis of statistical data extracted from the records of the *Global Terrorism Database*. The analysis was conducted on two different levels: on the one hand (1), some main versions of the records – relevant for the topic – were used in their *original form* as contained in the database, yet (2) we also formed a *social network database* with the data of organizations taking part in multi-party terrorist actions and the relations between them. During the data analysis, we use primarily descriptive statistics and simple, two-variable comparisons. The cooperation patterns of terrorist networks are illustrated with graphs, while the structures are indicated with simple network indicators.[2]

Data analyses

Diffusion of cooperative terrorist actions

0.7% of the terrorist actions analyzed in this study were executed in cooperation; on the basis of the information of the dataset, in total 930 such events were identified (Table 1).

[1] In our analysis, we look at a terrorist action implemented in cooperation as some special *innovation*, where there is a new form of organization behind the innovation (Schumpeter, 1980: 111.), so we aim to investigate the dissemination and diffusion of that innovation.

[2] The statistical calculations were made with SPSS 20, and the social network analysis was prepared with the Ucinet 6 and NetDraw software products.

However, the distribution of such cooperative attacks shows very special patterns both in terms of the dynamism in time and regional proportions.

Table 1

Distribution of cooperative terrorist actions by region

Region	%	Colour code
North America	5.1	
Central America and the Caribbean Islands	1.4	
South America	13.8	
East Asia	0.0	
Southeast Asia	5.3	
South Asia	29.7	
Central Asia	0.4	
Western Europe	4.9	
Eastern Europe	0.4	
Middle East and North Africa	28.9	
Sub-Saharan Africa	10.0	
Austral(as)ia and Oceania	0.1	
Total (N = 930)	100.0	

Source: Own calculation and editing based on GTD data

It is a characteristic feature of the dynamism in time of cooperation-based terrorist actions that one-tenth (11.1%) of such attacks were registered until 1990 and only slightly more than one-fifth (23.4%) of all cooperative attacks were made until 2000, too. Consequently, in terms of diffusion in time it may be concluded that *cooperation, as an operative tactic of terrorist organization has become a dominant feature in the new millennium.* However, the regional affiliation of global terrorism is another important factor. Such form of violent activities did not appear at all in the central and eastern regions of Asia, in the Australian region, in Eastern Europe or in the central region of the American continent at all, or only in a negligible proportion (Table 1). Approximately 5% of the cooperative terrorist actions took place in Western Europe, North America and Southeast Asia, while at least one-tenth of such actions could be observed in the regions of Sub-Saharan Africa and South America. *The majority of cooperation-based terrorist actions occurred in the regions of the Near East/*North Africa *and South Asia* as, practically, those two regions provided the scenes of more than half, almost three-fifth (58.6%) of all the related terrorist attacks. Taking into account both the differences in the global space and diffusion in time, other notable tendencies can be observed (Figure 1).

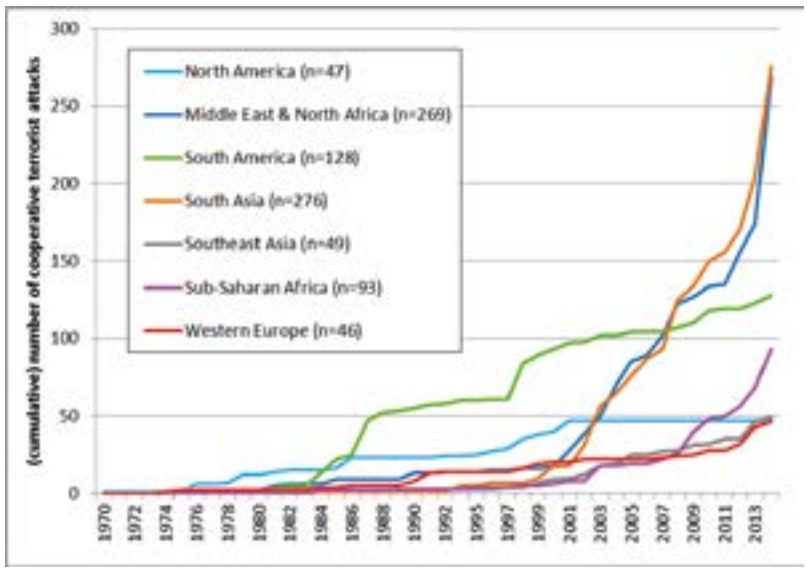

Figure 1

Diffusion of cooperative terrorist actions by region[3]

Source: Own calculation and editing based on GTD data

It may be concluded that the cooperation-based terrorist actions occurred in North America first but by the end of the analyzed period, i.e., 2014, the number remained lower than 50. As time went on, in the middle of the 1980s cooperation as a special form of carrying out attacks appeared first in South America and then, around 1990, among the organizations of Western European region. However, with the exception of South America, in the former regions the number of cooperative terrorist actions remained relatively low. The next milestone occurred in the second half, and at the end of the 1990s and around the millennium, when that type of attack began to spread in the regions of Southeast Asia and Sub-Saharan Africa, followed by a sudden and extremely rapid increase, as a result of which, by the end of the analyzed period, the number of cooperative terrorist actions was by far the largest in the Middle East, North Africa and Southeast Asia. In summary, it may be concluded, that by 2014, *the organizations using cooperation early reached a relatively low level with some moderate increase* and primarily *the organizations adapting that method later applied this "innovation" extensively.* A special tendency was that the growth in South Asia and the Near East/North Africa began parallel with the slowing and end of the growth in North America and that growth has been unbroken in the latter regions, where the diffusion curve is not getting any flatter, suggesting a further rise in the number of cooperative actions and the continuation of this very special innovation.[4]

[3] For the sake of more clarity, the figure only shows the regions which are associated with a higher number of actions, i.e., terrorist markets with major cooperative actions.

[4] The events of the last two years presumably indicate the continuation of these tendencies, but we do not have any data suitable for analysis in that regard.

Structure of the cooperation network

The global network structure of terrorist actions executed in cooperation is[5] not at all consistent: there are significant differences both in the number actors,[6] and in the relations between participants (Figure 2). As an example, the only terrorist action executed in cooperation in Australia and Oceania remains fully isolated in this map, but the situation is also similar in the East European terrorist market and its network relations, where the number of organizations is also rather low.

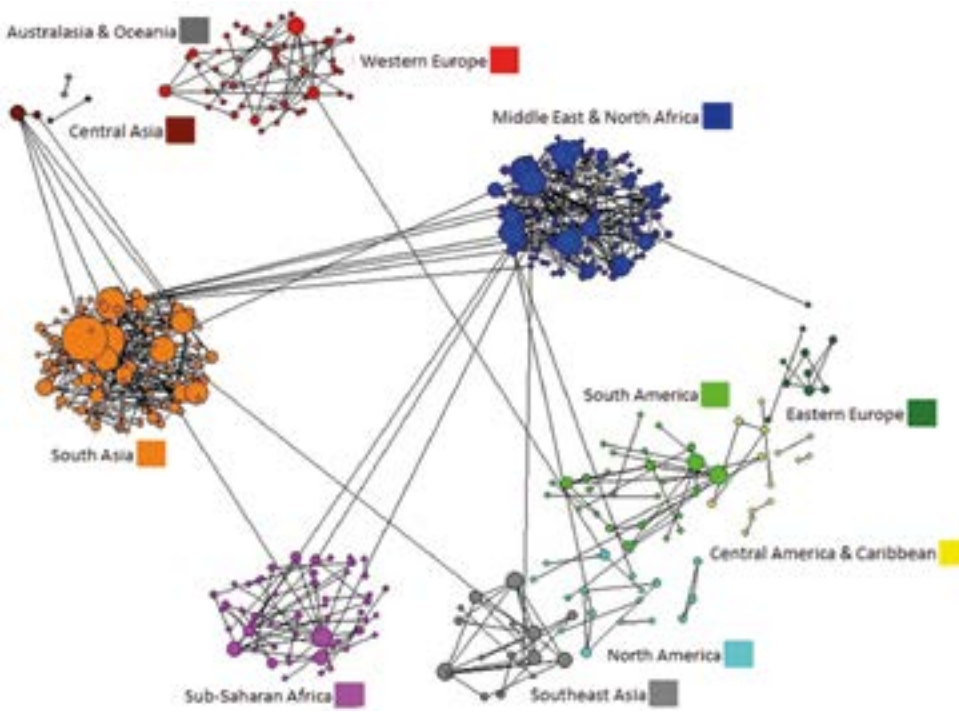

Figure 2

Graph of the global network of terrorist actions implemented in cooperation

Source: Own editing

[5] We wish to stress that our analysis *concentrates on the operative form of terrorism, interpreted at the level of actions* and that any alliance between the organizations is disregarded in this work. The latter is a large area and naturally an extremely interesting part of global terrorism, but *here our objective is to identify the network system of globally integrated terrorism developing on the basis of specific cooperation in actions.*

[6] The network constituting the subject matter of the analysis consists of 435 organizations that can be clearly identified or distinguished in the cooperation structure, i.e., the name of the organization is known (those included in the database as *"other"* or *"individual"* were left out), and their region of operation can also be identified (lack of information and unclear location were also considered missing data).

There are similarities between the central region of the American continent (Central America and the Caribbean Islands) and North America as well as the former Eastern Europe as basically a small number of not very significant organizations operate in the regions, yet they have bridging connections (Granovetter, 1991), i.e., they have relations with organizations from other regions.[7] Such an example is the South American region, which has the most widespread and, to a certain extent, *differentiated* cooperation network, where there are a number of actors that have relations with multiple organizations. Similarly, among those taking part in the network of terrorist actions observed in the region of Western Europe some major actors stand out; however, this region is still also isolated because it only has one common tie connecting it to the global network.

In that respect the Central Asia region is a kind of *contrary one*, which has a relatively high network integration with other regions, yet relatively few actors. However, at regional level the global cooperative network of terrorist actions is still *dominated* by the organizations of the Middle East/North African and South Asian regions, i.e. *"international" terrorism* according to the EU typology (Vincze, 2006: 119–120.) both in terms of numbers, network connections and their importance in the entire structure. These two regions, complemented by the Sub-Saharan and South East and Central Asian terrorist actors who have (multiple) relations with them, can be identified as the *dominant segment of the international terrorist network*. The *organizations* that are *most important* within the global system, i.e., have the most connections, operating the *South Asian region,* but the number of relatively important organizations stand out from the cooperation network in the Middle East, too.

Before identifying the central actors, let us briefly look at the whole global cooperation structure. In the sub-system formed by the interconnected actors of the network the geodesic distance[8] is 5.34 – which results in low compactness (= 0.040) and significant fragmentation (0.96). The centrality of the network is also low (Freeman's degree centrality = 0.27%); only 0.27% of the possible connections exist in the network. There are significant differences between the terrorist organizations in terms of the number of connections: the average degree is 5.17, i.e., on average one actor has this number of connections, which is coupled with high standard deviation (10.16). *Fourteen terrorist organizations* are above the average degree plus two standard deviations – 25.49 connections, i.e. high centrality (Figure 3) –, which therefore have *outstanding importance* in the global cooperation network of terrorists compared to the other organizations. These actors *cover one-third of the connections of the entire network* (32.28%) although represents only a fragment of all organizations (~3%). In terms of composition, this upper segment of terrorist groups is rather homogeneous as half of the network elements come from the terrorist organizations of the Middle East and North African regions and another four are also affiliated in the rather large South Asian region. One or two South American organizations and one Southeast Asian actors have also made it to the top.

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[7] The importance of weak or bridging corrections emerges at *macro level* in relation to the integration of the particular structure: the closely related high density sub-groups emerging from strong connections build a relationship through the weak connections (Granovetter, 1991).

[8] In a particular social network the geodesic difference between any two points is the shortest path between them, i.e., "the number of actors through whom the points can have any interaction" (Letenyei, 2006: 247.).

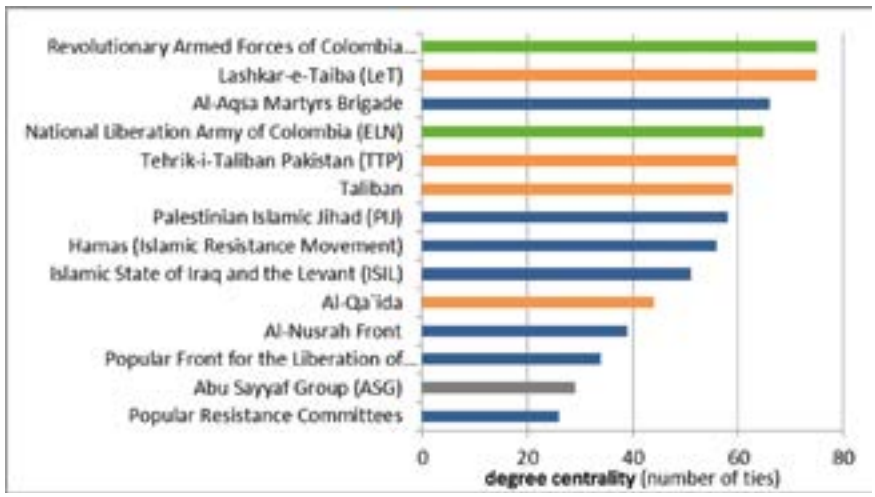

Figure 3

Major organizations of the cooperation network and their regional affiliation

Source: Own calculation and editing

Outcome indicators of cooperative terrorist actions

Cooperation provides considerable advantages to the participants: *the success rate of terrorist actions is also higher in attacks* executed in cooperation (Table 2). Approximately every ninth (90.9%) of the single actions – claimed by single organizations – is successful, but if cooperation evolves between the organizations, the ratio of successful attacks also becomes higher (93.9%).[9] Results also suggest that terrorist actions have *a more robust destructive force* when they are implemented by multiple actors in cooperation. Among the multi-actor terrorist events there are more[10] actions resulting considerable material damages (8.2% compared to 2.6%) and there are fewer cases leading to small and material damage (91.8% compared to 97.4%). Beside physical infrastructure, a terrorist attack implemented in cooperation is also *a more serious threat* in terms of *human losses*. While in actions executed by one organization on average 2.29 people die (not including suicide bombers), the attacks implemented by terrorist organizations in cooperation may claim 6.39 fatalities.[11] Similar and even stronger influence can be observed in the case of the wounded ones (again not including potentially wounded terrorist): cooperation raises the average 3 wounded observed in single actions on average to 10.25.[12]

[9] The difference is statistically significant: $Chi^2 = 9.828$; $p = 0.002$.
[10] The difference is statistically significant: $Chi^2 = 33.434$; $p = 0.000$.
[11] The difference is statistically significant: $d = –7.245$; $p = 0{,}000$.
[12] The difference is statistically significant: $d = –7.434$; $p = 0{,}000$.

Table 2
"Benefit" of cooperation

Type of the terrorist action	Successful (%)	Negligible material damage (%)	Significant material damage (%)	Fatalities (persons)	Wounded (persons)
single	90.9	97.4	2.6	2.29	3.02
cooperative	93.9	91.8	8.2	6.39	10.25
cooperation multiplier	1.03	0.94	3.15	2.79	3.39

Source: Own calculation and editing based on GTD data

In total, therefore, focusing only on the most important effects, cooperation almost triples the average number of fatalities of terrorist acts (cooperation multiplier factor = 2.79) and increases significant material damages and the average number of the wounded by more than three times.

Concluding remarks

As a general consequence of our analysis, the thought selected as the motto of this study *may be put into past tense,* as we have empirically proved that by 2014 a kind of connection *evolved* between the previously separate types of terrorism' (Haskó, 2002: 24.). Consequently, on the basis of our research results, we can state that (1) *terrorist actions implemented in cooperation* as a special type of the attacks are in fact a *western invention* as it emerged and spread first in the Northern region of the American continent, and (2) this form of cooperation *began to grow intensively* at the beginning of the new millennium and has become a mass phenomenon, predominantly in the *Middle-East/North African* and *South Asian regions, over the past two decades*. The (3) *social network structure of the attacks implemented in cooperation indicates global integration,* as on the basis of multiple (bridging) connections cooperative actions involve *inter-connectedness ,* embeddedness *between regions* ,as well as tight and dense internal networks. Finally, (4) the network embeddedness of terrorist actions has favourable consequences for the initiators and participants (greater probability of success, more significant material damage, more fatalities and wounded), yet these higher outcome indicators make this special form of cooperation an *outstanding social challenge* – spreading and diffusing according to the data – for the external environment and the potential targets.

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Erika Malét-Szabó

The Concept of Solid Morality in the Perspective of Development

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Abstract

Corruption is able to fundamentally shake order and predictability, which are the key features of security. Law enforcement agencies are determined to maintain security and order. Therefore, any activity which intends to prevent corruption or develop the staff's solid morality is particularly important. The aim of this study is to promote the development of educational and training work in this field. The senior management has defined some basic requirements towards the staff's solid morality. The study describes the results of a survey conducted among 149 people from the police vocational schools, the Faculty of Law Enforcement of the National University of Public Service, and the police executive staff. The way the different groups view solid morality help to develop training and educational material to achieve solid morality.

Keywords: corruption, integrity, solid morality, SZEM*model*, "good policeman", motivation, education and training, student, junior staff

Introduction

The concept of security (Németh, 2011) is rather diversified, and covers almost every aspect of life. *Order* and orderliness are among its main characteristics, clearly leading to predictability and transparency, which are the basic conditions of subjective security. *Corruption* fundamentally shakes order by providing an opportunity for violating the written and unwritten rules of order in exchange for some consideration, giving priority to the interest of an individual to the interest of others/of the community. This is why for any law enforcement agency which is responsible for maintaining security and order any activity that is aimed at preventing corruption both at individual and organizational level is especially important. One way of achieving that goal is to strengthen the ability of individuals to resist the challenge of corruption, i.e., their *solid morality,* which is supported by all theoretical and practical research aimed at disclosing the phenomenon of solid morality.

The research

Research background

The concept of solid morality was introduced into law enforcement by Minister of Interior Dr. Sándor Pintér at the ministerial educational meeting in 2014. That meeting set a task of researching the psychological tools with which law enforcement agencies could combat corruption effectively and elaborating psychological questionnaires for selecting more effectively any inclination for corruption *(solid morality indicator)* (BMSZÜ/43-4/2015.). The volume of studies (Malét-Szabó, 2015a) summarising the results of the first research activities conducted in that regard within the framework of the ÁROP-2.2.17-2012-2013-0001 new public service career priority project was released partly aiming at implementing that task. In the studies the authors define solid morality and describe the SZEM*model* (recommended for measuring solid morality based on theoretical and practical aspects, Hunyady–Münnich, 2016). Based on the theory of planned behavior developed by Ajzen and Fishbein (Ajzen, 2005), the SZEM*model* emphasizes the role of the *subjective attitude, norm* and *behaviour control* of the individual with some other complementary components (see Figure 1) in the development of resistance to a corruption challenge, i.e., intention to behave in line with solid morality, and the prediction of the specific behaviour accordingly.

Figure 1

Characteristics of the internal correlation of the SZEMmodel

Source: Hunyady–Münnich, 2016: 52.

It is important to emphasize that, according to one of the basic ideas of the SZEM*model,* solid morality behaviour is not a congenital feature but is learnt during the development and socialization of the individual, which makes it an ability that *may be developed* and providing an excellent basis for any educational, training and further training activity.

That is how a questionnaire-based survey implemented within the framework of the respective research of the Scientific Council of the Ministry of Interior described in this study was launched to identify the subjective content of solid morality and its subjective place in the expectations for a good policeman, primarily to assist educational, training and further training activities aimed at the development of solid morality.

Research methodology

Focusing on the primary target groups of law enforcement education, training and further training activities, in my research I addressed *students of law enforcement vocational schools, students* of the *National University of Public Service, Faculty of Law Enforcement* (hereinafter NKE RTK) and the *members of the active police staff primarily involved in execution tasks* and most often exposed to corruption challenges. 149 people completed the full questionnaire; 37 of them were first form students of Adyliget Vocational School of Law Enforcement (hereinafter RSZK), 48 people were first-year students of NKE RTK and 64 people were official members of staff of four police headquarters. Within the total sample, 65.8% were men and 34.2% were women.

The research was conducted with a paper-based questionnaire, containing the following 5 questions:

1. *Why did you choose a career in the police/law enforcement?* (It was a multi-choice question.)
2. *In your opinion, how well will you satisfy the 'good policeman' expectations?* (Answers given on a scale of 11 degrees.)
3. *In your opinion, what characteristics must a 'good policeman' have"?* (The three main characteristics had to be defined.)
4. *In your opinion, how difficult it is to comply with the 'good policeman' requirement in everyday work?* (Answers given on a scale of 11 degrees.)
5. *What does solid morality mean to you?* (it was an open question.)

Primary result of the research, identification of the content of the concept of solid morality

The concept of solid morality (Malét-Szabó, 2015b) appears as an opposite of corruption, just line *integrity,* in the *National Anti-corruption Programme* (2015: 5.), which refers to intactness, impeccability, incorruptibility and purity. Its description and definition may be based on a number of approaches: only on theoretical basis, relying on the processing of the technical literature (for which the SZEM*model* is an example (Hunyady–Münnich, 2016: 64–65.), or relying on the results of empirical research, focusing on the opinion of managers, the junior staff or students of educational institutions.

Practical approach to the concept of solid morality from managers

A certain practical approach to the concept of solid morality refers to the assessment and summary of the opinions of number one managers who fundamentally determine the activities and operation of law enforcement agencies and the requirements for the staff. The following definition is an example:

"Solid morality is a personality feature of an individual with which they accept the effective social norms (including legal and ethical norms), following them without hesitation and protecting them persistently.

Consequently, a colleague with solid morality

- *fully complies with the social norms, i.e., the written and unwritten rules indispensable for maintaining the public trust required for the operation of the law enforcement agencies in terms of personality behaviour and thinking;*
- *and complies with them in their professional and private life under all circumstances;*
- *lives their lives based on those rules and moral credo;*
- *and is also exempt of any actual or apparent aspect which would influence those characteristics negatively."* (Malét-Szabó–Csató, 2015: 24.)

In summary, a colleague with solid morality will not hesitate in any situation where they face a moral (corruption) challenge.

Practical approach to the concept of solid morality from the staff

Another practical approach to the concept of solid morality relates to the survey and summary of the opinions of the policeman executing tasks and most exposed to corruption challenges in most cases, as well as of the first-year vocational school and university students intending to join the police force, who are not included in the group of managers. The research described in this study is a good example of it.

According to the results, the subjective concept of vocational school and university students and policemen, who are members of active police staff about solid morality matches a great deal the opinion of the number one managers of the law enforcement agencies. On the basis of the content analysis of the responses to the open question asked form them, the most frequently mentioned contents were as follows: *I do not give in and resist temptation (54.6%), following social norms (34%),* and *following the norms that have become internal norms (22.7%).* These elements together almost fully cover the definition of top managers.

Table 1

Breakdown of the content elements of solid morality in the research sample

Subjective content elements of solid morality	**Number of persons**	**%**	**Percentage ratio**			**Independence assessment (Chi box)**
	141	100	Adyligeti RSZKI (36 persons)	NKE RTK (48 persons)	Police (56 persons)	
I do not give in	77	54.6	50	79.2	37.5	$p < 0.001$
Following social norms	48	34	41.7	18.8	42.9	$p < 0.05$
Following the norms that have become own/internal norms	32	22.7	19.4	22.9	23.2	–
Integrity	22	15.6	13.9	10.4	21.4	–

Avoiding bad	14	9.9	8.3	18.8	3.6	$p < 0.05$
Honesty	13	9.2	2.8	4.2	17.9	$p < 0.05$
Performing required tasks	13	9.2	0	8.3	16.1	$p < 0.05$
Solid morality also followed in private life	12	8.5	0	4.2	17.9	$p < 0.01$
Exemplary conduct	10	7.1	8.3	6.3	7.1	–
Following good	7	5	11.1	6.3	0	–
Persecution of crime	5	3.5	2.8	4.2	3.6	–
Choosing good even if it involves suffering	5	3.5	2.8	2.1	5.4	–

Source: Own editing

Comparing the results of the 3 research groups (see Table 1), it is clear that the strongest difference can be observed in the "I do not give in" component, which appears most frequently in the entire sample. The ability and intention of increased resistance to external negative impacts occurred by far most frequently among university students (79.2%), and the least among the policemen who are members of the active staff (37.5%). Presumably this also stems from the strong self-confidence of young people and their idea, which is most probably an actual intention at that age, that they are able and willing to resist any negative impact, bad or crime arriving from the external world. This tendency is especially strong among the university students who usually think and consider themselves more positively partly on the basis of their actual results, as they study at a university, and appears only to a moderate (average) extent among the students of the vocational school of law enforcement. The members of the active police staff who have more life and work experience are most probably aware of the limits of their own abilities and the external forces and impacts of temptation affecting them. Consequently, in their case in the content of the concept of solid morality the importance of the ability of *solid resistance* (37.5%) is only secondary to *the following social/moral norms (42.9%),* which is also associated with the highest rate of appearance of *performing required tasks and moral conduct also followed in private life* found in the research sample.

It was an interesting result that while *following social norms* appeared most rarely among university students (18.8%), the *avoiding bad* content element also appeared by far the most in that group (18.8%). Obviously, this element belongs to the social norms, just like the *following good* content element, which occurred most frequently among the vocational school students (11.1%).

Most important characteristics of a good policeman

In order to define the 3 most important characteristics of a good policeman, the respondents had to choose from 11 characteristics in the questionnaire, each of which may be considered a basic requirement for a policeman suitable for professional service [Act XLII of 2015, Section 33; Joint Decree 57/2009 (30 September), Annex 6].

Table 2

Breakdown by percentage of the characteristics of a good policeman in the research sample

Breakdown in percentage of the required characteristics of a good policeman in the individual research groups, presented in an order, decreasing according to the ratio of their appearance			
Total (149 persons)	RSZKI (37 persons)	NKE (48 persons)	Policemen (64 persons)
decisiveness (65%)	decisiveness (70%)	decisiveness (63%)	decisiveness (64%)
integrity (51%)	good problem solving ability (54%)	integrity (46%)	integrity (64%)
solid morality (48%)	solid morality (51%)	good problem solving ability (42%)	solid morality (55%)
good problem solving ability (43%)	integrity (35%)	solid morality (38%)	good problem solving ability (38%)
good conflict management (33%)	good conflict management (30%)	good communication skills (33%)	good conflict management (38%)
Total (149 persons)	RSZKI (37 persons)	NKE (48 persons)	Policemen (64 persons)
good communication skills (24%)	good physical strength (19%)	good conflict management (29%)	good communication skills (22%)
good physical strength (13%)	adequate appearance (16%)	ability of control (17%)	good intellect (14%)
adequate appearance (12%)	good communication skills (14%)	good physical strength (17%)	adequate appearance (11%)
good intellect (9%)	good intellect (5%)	adequate appearance (10%)	good physical strength (8%)
ability of control (7%)	ability of control (5%)	good intellect (6%)	other (2%)
other (1%)	other	other	kindness (2%)
kindness (1%)	kindness	kindness	ability of control

Source: Own editing

Table 2 summarising the respective results shows well that *decisiveness* appears most frequently (63–70%) as a characteristic feature required from a good policeman both in the total sample and in the sub-samples. It is followed by the trio of *integrity* (35–64%), *solid morality* (38–55%) and *good problem solving ability* (38–54%). Of those, integrity, which is a concept close to solid morality, is not in second place only among the law enforcement vocational school students, while solid morality is in fourth place only among the university students, but is in third place in the other sub-groups and in the whole sample. It is probably due to the participation in training and the training topics that the importance of good problem solving ability is more important than solid morality for students, although among the university students integrity was placed higher.

Analyzing everything from the aspect of solid morality, it may be concluded that for the respondents in general solid morality is of outstanding but not of primary importance together with integrity, which is a partially related concept, among the characteristics expected from a good policeman.

Is it difficult to be or remain a good policeman?

It indicates compliance with social expectations and the high degree of self-confidence of the respondents that many of those who completed the questionnaires thought that they complied very well with the expectations for a "good policeman" (average = 9.29 on the scale of 11). The opinion of vocational school students reflected the highest degree of compliance, and the opinion of the university students reflected the lowest level (but even in their case the respective average was 9.02).

There was a greater difference among the research groups in the responses to the question of *how difficult it is in general to meet the expectations for a "good policeman"* in everyday work (Kruskal–Wallis test, $p < 0{,}01$). Those vocational school students (average 7.3) and university students (average 7.83) who did not have any specific practical experience yet described it as more difficult than the policemen who already had practical experience (average 5.89).

Motivation for becoming a policeman

Identifying the main motifs why young people choose a career in the police is crucial to assist any attempt to develop solid morality, because it can directly influence the full integration of an individual into the organization of the police. Table 3 presenting the results shows well that the attractive effect of the career in the police *as an assisting profession* is clearly ranked first (60%) but, in addition to the actual motivation of the respondents, the choice was also probably affected by the socially strongly desirable nature of that aspect. The *exciting aspects* of a career in the police was ranked next with an identical percentage (52%) among the vocational school and university students together with the respondents' confidence in their *suitability* for that career. It was followed by the *attraction of a police career stemming from childhood* (37%), which also occurred most frequently among the vocational school and university students (41–50%), and the career, presumably guaranteed in the police, which was important mostly for the vocational school students (37%). Contrary to the above, the *guaranteed income* (36%) which was also mentioned in a similar percentage, turned out to be most important among the active policemen (42.2%). It is an interesting aspect that almost every third respondent selected the response of "I have always liked crime series and films about crimes". Nonetheless, 15–17% of the respondents openly stated that they did not opt for a career in the police based on their internal motivation in part or at all but as a result of a kind of passive drifting, or with the intention of following the *example of the parents*.

Analyzing the above from the aspect of solid morality, it may be concluded that while the assisting attitude, important for all, and presumably standing in the first place in terms

of social desire is likely to support the emergency and development of solid morality, in the case of vocational school and university students the especially emphasized excitement involved in police work and financial motivation, which was the strongest among vocational school students in terms of career and among the active staff in terms of guaranteed income are likely to pose a certain challenge to solid morality.

In terms of assisting educational and training work, it should clearly be emphasized that among the vocational school and university students emotion driven choices are in the first place among the motivation factors and, in the case of university students, they are also completed with the attraction of excitement and the drifting in the choice of career, indicating the uncertainty of deliberate career choice.

Table 3

Breakdown by career motivation factors in percentage in the research sample

Breakdown of the career motivation factors in percentage in the research groups		**Number of persons**	**%**	**Percentage ratio**			**Independence assessment (Chi box)**
		141	**100**	**Adyligeti RSZKI (36 persons)**	**NKE RTK (48 persons)**	**Police (56 persons)**	
1	I've always wanted to do something that is useful for mankind	90	60.4	80.6	64.6	46.9	$p < 0.01$
2	I like helping people	89	59.7	61.1	60.4	57.8	–
3	I am attracted by exciting things	77	51.7	63.9	66.7	34.4	$p < 0.01$
4	I thought I would become a good policeman	77	51.7	55.6	62.5	40.6	–
5	I always wanted to be a policeman from my early childhood	55	36.9	50	41.7	26.6	$p < 0.05$
6	A career in law enforcement is what I am looking for	55	36.9	63.9	35.4	21.9	$p < 0.001$
7	I was looking for guaranteed income	53	35.6	25	33.3	42.2	–
8	I have always liked crime series and films	44	29.5	22.2	43.8	23.4	$p < 0.05$
9	This was the only thing that I was somewhat interested in	26	17.4	16.7	25	12.5	–
10	I am attracted by the uniform	22	14.8	27.8	16.7	6.3	$p < 0.05$

11	I have a lot of policeman/ law enforcement employees among my friends	16	10.7	11.1	16.7	6.3	–
12	I have also been injured before	15	10.1	16.7	14.6	3.1	$p < 0.05$
13	My parents also work for the police	14	9.4	11.1	10.4	7.8	–
14	My parents wanted it	7	4.7	8.3	2.1	4.7	–
15	other	6	4	5.6	2.1	4.7	–

Source: Own editing

Conclusion

As a conclusion of this paper, the practical utilization of the results should be highlighted which, apart from representing real progress in the Hungarian application of the integrity methodology, could also be especially relevant in planning educational and training work in various training institutions. The SZEM*model*, created as the solid morality measurement model, provided a theoretical framework for training and development. The results of this research, according to which the subjective opinions of first form law enforcement vocational school students, first-year students of NKE RTK and active policemen about the content and role of solid morality in becoming a good policeman, can indicate a direction in competence development, which is becoming increasingly important in secondary and higher education and also in the regular training of the active staff and is also aimed at the development of solid morality. This is why we consider it important to gradually integrate the results achieved so far in the practical HR activities of the police.

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BMSZÜ/43-4/2015. Schedule of the selection and training of the professional staff, training for new tasks and for the implementation of the activities defined at the ministerial educational meeting in 2014

National Anti-corruption Programme. (2015) Source: www.kormany.hu/download/5/e8/50000/Nemzeti%20Korrupci%C3%B3ellenes%20Program.pdf (05.07.2016)

Tímea Vas – János Csengeri

Security Challenges at Airports Today

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Abstract

As can be seen from the title, our paper intends to be thought-provoking in the topic of airport (more widely aviation) security. We discuss the difference between the two terms of "safety" and "security" (the Hungarian language has only one expression for these two terms). In the article we overview the stakeholders of aviation, the current safety management system and the security-related approaches, research, and solutions.

Keywords: aviation safety, airport safety and security, safety management system, predictive approach

Introduction

Air transport is one of the most popular modes of transport today, and it is also a dynamically developing industry. Hundreds of thousands of passengers, thousands of tons of cargo pass through the busiest airports on a daily basis, the safe and efficient handling and processing of which is ensured not only by airport staff and air traffic services, airlines, but also by cooperating third parties, businesses, organizations and staff.

Although aviation is a heavily multi-secured form of transport, the risks and hazards, as in any system, are constantly present here as well. Yet when compared to other modes of transport, we find that the nominal value and the specific rate of serious and fatal accidents are considerably lower, aircraft disasters, seem to be more far-reaching. This is due to the fact that they receive much greater public attention, especially if the accident is caused by an external impact (e.g. terrorist attack). On the other hand, recovering wrecks, detecting the exact causes of an accident, and making the right conclusions normally takes a longer time, in some cases it is perpetually uncertain (Flight MH370, March 8, 2014).

In our brief paper, we review the terminological complexity of aviation safety, clarify misunderstandings arising from the English terms, and discuss airport security issues within these conceptual frameworks.

Elements taking part in air travel

In a release published in 2014 (Meyer–Mudra, 2014), we get a brief summary of the elements of aviation. Accordingly, these are the following:

- aircraft and its crew;
- airport and its staff;
- air traffic service and its personnel.

This is now being complemented by the travelling public, which is not involved in operating air traffic, but they are themselves the subjects of air traffic most exposed to security risks, threats and dangers, and from the point of view of airport security they may pose threats themselves. Figure 1 illustrates the relationship between the actors and the directions of external and internal threats.

Figure 1

Actors of aviation, and the graphic representation of threats against aviation security and airport security

Source: Own material

Misunderstandings arising from the English terms

The notion of security has been defined by experts from many fields of research, depending on the specifics of the subject. For the purposes of this article, we consider the following definition to be the most appropriate: "security is provided when the threat is minimal" (Ürmösi, 2013: 150.). However, in the area of aviation, this is to be approached more accurately, especially in the context of the many literary sources in English. Let's briefly look at what concepts we may encounter, and what exactly is to be understood under these terms.

In the Hungarian language both *safety* and *security* are generally understood as "security", but there is a significant difference between the two terms. *Safety* refers to a condition where air traffic risks directly linked to aircraft and the direct support of their operations are kept to a minimum acceptable level (Annex 19, 2013). The term *security* covers the protection of international civil aviation against unlawful acts. This objective is achieved through the combination of measures, a combination of human and material resources (Annex 17, 2006). Accordingly, it is worth clarifying what we mean in the following subfields.

- *Aviation safety:* safety of air transport, safe implementation of processes related to flying an aircraft, aircraft control, design, maintenance, manufacture, in terms of human factors, procedures, tools, and organizations. (Looking for internal threats for air transport as a whole, see Figure 1: Inner Threat4.)
- *Flight safety:* the human factors, tools, and procedures required for the safe execution of flight as a process.
- *Aviation security:* safeguards the security of aircraft processes, instruments, procedures, human factors, and protects against deliberate, unlawful or unintentional attacks on aircraft flight, design, maintenance and production. (Also considering the aviation as a whole, but looking for the external threats, see Figure 1: External Threat2.)
- *Airport safety:* the means, procedures, buildings and human factors necessary for the safe execution of all aviation in the aerodrome of the airport. (Similar to the first concept, it seeks to address threats that are internal to the organization, but only to one of the elements of aviation, focusing on the airport, see Figure 1: Inner Fencing3.)
- *Airport security:* the means, procedures, organizations and human factors necessary to guarantee the security of the infrastructure for the transport of goods, passengers and luggage. (It also looks for protection solutions for the airport, but can be used against external threats, see Figure 1: External Threat1.)

Against this background, the term *safety* will be used as security and the term *security* term will be used as a protection.

Peculiarities of the safety management system (SMS, SeMS)[1] in certain areas of air transport

The various dangers and threats are constantly present in all areas of air transport, including airports, air traffic services or even the operation of aircraft. In order to allow these elements, organizations and persons working within them to work together with aviation safety in mind, ICAO[2] issued Annex 19 on the operation of the safety management system in February 2013. The appendix states that safety must be understood and approached at the level of the air transport system, including all necessary organizational structures, re-

[1] *Safety Management System:* a system for managing safety; *Security Management System:* a system for managing protection.

[2] *International Civil Aviation Organization:* an organization of the United Nations dealing with aviation; it has 191 member states, including Hungary.

sponsibilities, policies and procedures (Annex 19, 2013). ICAO also requires Member States to provide for a national flight safety program and to operate a flight safety management system for licensed training organizations where aviation safety risks may arise; for aircraft operators[3] engaged in international commercial operations; for the maintenance organization with official license; for organizations designing and manufacturing aircraft and aviation equipment; for the commercial airport operator and the air traffic service.

In 2012, as a model for the safety management system (hereinafter referred to as "SMS"), the Ministry of Transport[4] of the United Kingdom submitted a proposal for the development and operation of a protection management system (hereinafter referred to as SeMS) at London airports (Goodwin–Christensen, 2013). Below we will briefly review the principles, elements and features of both systems, as well as the uniformities and differences.

Any organization that uses SMS is provided with *safety policies*. The essence of the policy is to define the person responsible for the safety, the service, the responsibilities, the areas with special security/protection factor, procedures, and perhaps the most important one: the reporting system in support of communication and information gathering. These elements can be identified in both the SMS and the SeMS. The reporting system is effective and security-enhancing, by being voluntary and stimulating. This means that any event, whether it is a runway incrusion due to a procedural error or an unidentified piece of luggage discovered late for a similar reason, is reported immediately. To ensure that all members of the organization fulfil their reporting obligations voluntarily and without delay, the system operates under the so-called *just culture* ("trust") principle. In the SeMS's reporting system, the so-called "If You See Something, Say Something", launched as a campaign by the US DHS[5], is used to record and investigate not only reports from staff, but also from passengers and other external sources.

Table 1

Safety management matrix

		Severity				
		A	**B**	**C**	**D**	**E**
	Frequency of occurrence	Catastrophic	Dangerous	Moderate	Low	Negligible
5	Frequent	5A	5B	5C	5D	5E
4	Occasional	4A	4B	4C	4D	4E
3	Slight	3A	3B	3C	3D	3E
2	Unlikely	2A	2B	2C	2D	2E
1	Extremely unlikely	1A	1B	1C	1D	1E

Source: ICAO Doc 9859, 2013: 178.

[3] Aircraft and helicopters subject to Annex 6, Part I or Part III, Section II.

[4] Ministry *for Transport.*

[5] *Department of Homeland Security:* the equivalent of the Hungarian Ministry of Interior.

The next important element is the so-called *risk management*. The first step is to identify, then analyze and reduce risks and operate a *monitoring* system that will help maintain the safety level. An airport SMS can be found in a number of places, whether it is a work area's priority traffic zone or docking procedures. For the same reason, the SeMS of the airport also prioritizes the monitoring system (Becmann–Price, 2014). Both systems conduct risk management with scientific methods. Such is the preferred SHEL or ICAO 5M model adopted by the ICAO or FAA. SHEL (Software, Hardware, Environment, Lifeware) examines and evaluates the relationships between aviation security and assesses the risk assessment matrix (Table 1). Potential risks can be assessed using the matrix, depending on their probability and severity. The advantage of the risk assessment matrix is that it can be customized, depending on the identity, probability and severity of the risks involved in the organization of the airport's organization and the aviation activities it conducts, enabling the organization's responsibilities to be clarified, developing procedures and methods for reducing the risk and reviewing the effectiveness of those procedures. Based on the matrix, the risks in the red and yellow categories fall into the less tolerable range, and it is necessary to take action to reduce these risks – to mitigate either the severity factor or the occurrence probability factor.

5M uses a somewhat different method to analyze the risks. The first M: mission, that is, the precise clarification of the task. The second M: man, that is, is equal to the human factor. The third M: machine, therefore, includes all the tools that are in the system of human-machine contexts. The fourth M: management, which means the procedures. The fifth M: media, which refers to the social environment in which the system is interpreted, in this case the airport (Figure 2).

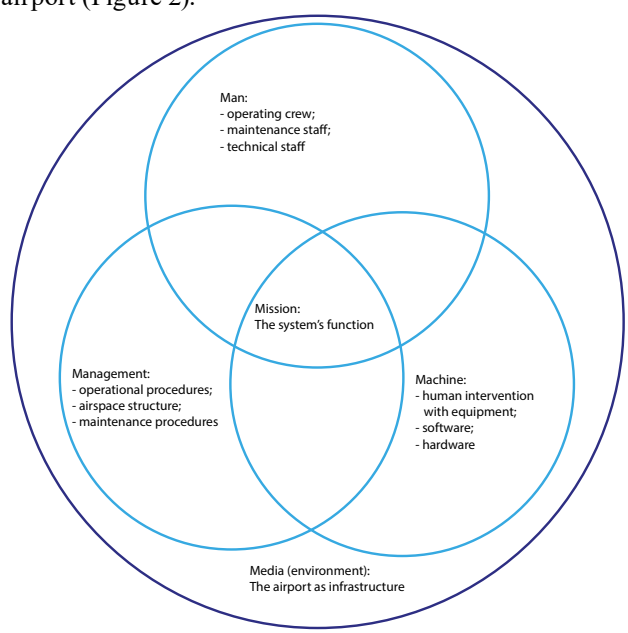

Figure 2
The 5M model

Source: FAA System Safety Handbook, 2000: 3–16.

The last element of SMS and SeMS is to *warrant and guarantee security*. In order to keep the threats and risks at the lowest possible level *(ALARP – as low as reasonably practicable),* continuous and comprehensive auditing and quality assurance are required. The audit may be conducted by the competent authority or by an authorized body designated for this purpose. The study identifies so-called safety/protection performance indicators that show how effective the system works and how well the goals set in the guidelines are met and which essentially represent a measure of the reputation and reliability of a given organization.

Approaches to airport security

Initially, a *reactive* approach to aviation safety was prevalent in the development of safety equipment (and, in general, different types of equipment). With this attitude, we only reacted to incidents and accidents, we did not have any preventive solutions. These resulted in the pursuit of research, development, or the use of procedures or equipment. Thanks to these, the state-of-the-art equipment of airplanes and aviation areas has evolved that not only allows the airplane to take off into the air but also provides safety of air transport. Just to mention a few examples: basic onboard instruments of the airplanes (altitude and airspeed indicator instruments, instruments measuring the parameters of the engines or other main components), all hardware related to air traffic control (including navigation equipment) and software, etc.

The next step to increase safety was a *proactive* approach that, based on the experience gained, has developed equipment or procedures that avoid potential risks and hazards. Here, we must mention the ICAO Safety Management Handbook, which has been in force since January 2009, to provide guidance to stakeholders in general to address the risks that have already been identified in flight (Meyer, 2015). The preparatory, forward-thinking attitude is thus realized, which is marked as a proactive approach.

The proactive approach, however, should not be confused with the *predictive approach* that is created as a result of real-life planning and research. In this case, we are preparing for events that are considered to be potential or expected, which have not been experienced so far, or we may infer from their trends and signals that they are occurring. Research is therefore required (for purposes of this writing, primarily in the area of protection), defining the vulnerable points that offer the possibility of assault, rather than thinking ahead, as it were, in place of the attackers. We believe that this approach has an important role to play in enhancing and improving airport protection *(airport security).*

For aggressive acts involving human casualties (e.g. terrorist attacks), both proactive and predictive approaches should be applied. In aviation security, the complex approach must dominate. However, experience has shown that we must also be responsive to attacks, so keeping reactive procedures up to date is also an important task. We are thinking here primarily of securing the airport, preventing further casualties or accidents, and care for the wounded, and restoring the normal conditions.

Security-enhancing research and solutions to protect airports

Two of the most desirable ways of addressing the challenges and threats are the predictive (prevention that averts even the possibility of threats emerging) and the proactive (also preventive in nature but it averts an already emerging threat) approach. Among reactive solutions, we can bear in mind the arrest of the perpetrators of bomb attacks (Lukács, 2009) or the plans for dealing with attacks perpetrated with the use of weapons of mass destruction (AEP, ASP, ACP) (Rankin, 2014). Furthermore, the bombings at the airport (such as the March 1966 bombings in Brussels and the bombings in Istanbul a few months later), then restoring the original conditions and managing hostage situations (Horváth, 2008), can also be listed here.

During the passenger security screening at the airports, explosives, weapons, and other illicit materials (e.g. drugs, valuable objects, excessive volumes of liquids, etc.) are detected with the use of current technology. To detect these items/materials X-ray beam detectors, metal detectors, explosives sensors and fluid analyzers are used (Szabó, 2016). In today's mechanized world, it is a curiosity, but it is possible to use service dogs to detect explosives or other prohibited objects (Daruka, 2009). These methods can be referred to as proactive methods, because if an individual carries a prohibited item and is detected when going through the passenger security screening on the airside, the threat is already in progress and will be removed immediately before the flight.

The most desirable solution, however, is having predictable procedures that also prevent the emergence of a threat. We can see more development in this direction. At airports it is not desirable to allow the formation of large groups of people, which has created a very simple solution to mitigate this: online check-in from the comfort of the passenger's home. This reduces the number of rope lines in front of the airline's counters and also reduces the waiting time at the airport before take-off. There is also an automated passenger control system among the airport security solutions, which also aims to reduce the number of large groups (Gunnebo), increasingly sophisticated surveillance systems (Proximex, SAAB, Siemens, Thales) and advanced decision support systems (Qognify). For surveillance systems, it would be important to have a function capable of measuring biological and behavioural parameters and then highlighting potentially high-risk persons. In the area of prevention, it is also important that the decision-support system of the airport solves the rapid and efficient exchange of information with the intelligence services. The task to be solved is to conduct surveillance of the hitherto less controlled peripheral areas, from which threats arrive (car park, freely accessible area of the terminal, etc.). The fences surrounding the airports also represent a very important preventive system, but not only because of their physical obstacles, but also by various procedures and solutions which multiply their obstacle and arresting function. Their lower part is dug in the ground, elements impeding passage are attached to their upper rims, and develop a motion-sensor and warning system (SightLogix) along their path. We can give an example of an Israeli airport solution where robot technology is used for controlling and patrolling perimeter fences (Olivier, 2014).

As part of the predictive approach, it is important to look into the future and to look at options that are likely to occur at airports and to develop appropriate solutions to them. The predictable approach in this case is the implementation of the SeMS system, following overseas examples, helping to identify existing or emerging *gaps* in the system, assess their risks and minimize them to their lowest acceptable level. There are a number of new chal-

lenges facing airports, both from a safety and a security point of view. This is the case, for example, with flights carried out with remotely controlled flying apparatuses (drones) which, in themselves, carry security risks, but if they are used to carry out an attack, they pose a threat to flight security in the form of a terrorist attack. There is also a kind of biological attack (similar to suicide bombings) when a person infected with a rather aggressive, virulent disease travels around the Earth in 24 hours, using airports as a kind of "virus distribution centre". These are, therefore, challenges that need to be answered and further opportunities for attacks need to be forecast, and we must manage them in theory.

Summary

In this article, we gave a review of the various aspects, characteristics and challenges of airports and security through an overview of international and national literature related to this topic. We considered it important to list the procedures and systems that analyze the security and defence strengths and weaknesses of certain areas and assets of the airport using a risk-based approach in line with today's challenges. As a further use of this short study, we would like to thematically examine the security challenges of jointly operated airports that are, for the time being, in the design phase.

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Zsuzsánna Biedermann

The Root Causes Behind Migration from Sub-Saharan Africa to Europe

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Abstract

Migrants have been moving from Sub-Saharan Africa towards Europe for decades due to conflicts, repressive regimes and economic hardship. One of the key factors of African emigration is the economic backwardness of the continent, which arises from the unfavourable role it plays in the global economic system and from the fact that African governments are unable to create enough jobs for younger generations. This latter is due to Africa being primarily stuck in natural resource extraction and agrarian sectors, exporting mostly unprocessed raw materials that have little technological-scientific added value. The recent dynamic growth in Africa is not based on structural transformation but on natural resource exploration and growing world prices for some natural resources. Endogenous (structural transformation has not yet taken place) and exogenous (Africa's role in global value chains is marginal) reasons together with political instability and authoritarian regimes push a substantial part of Africa's population to leave the continent.

Up to 2011, the beginning of the Arab Spring, North-African regimes were more or less able to prevent migration flows from reaching Europe due to their border control systems and jobs available for Sub-Saharan African migrants. Since the 2011 events, the 1700 kilometre-long coast of Libya has practically been uncontrolled, therefore, Libyan ports have become major starting points for illegal migrants wanting to reach European shores through the Mediterranean Sea.

Therefore, the study analyzes the security situation in Libya and its influence on migration from Sub-Saharan Africa to Europe. On the other hand, it also deals with the root causes of African economic backwardness and their role in African emigration.

Keywords: migration, Libya, global value chains, resource curse

Introduction

During the last few years, increased illegal migration from Sub-Saharan Africa[1] and the Maghreb countries received particular attention and reinforced the Europeans' fear from mass exodus (Castles et al., 2014; Cuttitta, 2007; Goldschmidt, 2006; Lutterbeck, 2006; Lőwiné, 2015; Póczik, 2011; Szabó, 2006). Since the majority of the Sub-Saharan African refugees reaches Europe through Libya, this present study examines the impact the Libyan revolution had on migration. On the other hand, it also tries to throw light on the causes, particularly on the economic situation of the countries of origin. Revealing the causes of the economic backwardness of the African continent, we can understand to what extent economic causes explain the increasing migration from Africa to Europe.

The change in Libya's role in migration as an impact of the Arab Spring

The security policy situation in Libya, a country previously functioning as a filter, now as a gateway in the migration process from Sub-Saharan Africa to Europe, is contributing significantly to increased migration. Until 2011, the beginning of the Arab Spring, the North African regimes achieved more or less success in stopping the refugee flow. This was partly due to their strong border protection system and partly to the employment opportunities they offered their citizens. Since the 2011 revolution, Libya's[2] more than 1700-kilometre-long coast has virtually become uncontrolled, enabling Libyan ports to turn into the main starting point for illegal immigration to Europe through the Mediterranean Sea (Frontex, 2015).

Estimates suggest that 2.5 million migrant workers were employed in Libya at the beginning of 2011, some 1.5 million of them illegally (UNHCR, 2011). Among the foreign nationals living in Libya, a country with 6 million inhabitants, the ratio of people arriving from Sub-Saharan Africa was significant, according to the International Organization for Migration[3] (IOM, 2011).

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[1] Sub-Saharan Africa: the area that lies south of the Sahara (earlier called Black Africa). Sub-Saharan African asylum applicants continue to come to Hungary. Until June 2015, statistics were only published regarding Afghan, Syrian, Kosovan, Pakistani and Iraqi asylum applicants and asylum applicants from other countries were classified into the category "Other" in the statistics drawn up by the Immigration and Citizenship Office (Bevándorlási és Állampolgársági Hivatal). On the basis of those statistics in the first half-year of 2014 1429 persons, i.e. 26.29% of all asylum applicants arrived in Hungary from other countries, whereas in the first half-year of 2015 7478 persons, i.e. 11.2% of all asylum applicants arrived from other countries. The "other" issuing countries also include countries of Sub-Saharan Africa. In June 2015, in Hungary, from the 31,287 asylum applications 1442 were lodged by people arriving from a sub-Saharan country (4.609% of the asylum applicants), in high numbers from the Republic of Congo, Nigeria, Eritrea, Somalia, Sudan, and Cameroon. In August 2015, 1409 of the total number of 47,094 asylum applications were lodges by citizens of a sub-Saharan African state (2.992% of asylum applications), in higher numbers from Senegal, Somalia, Sudan, Nigeria, Eritrea, and Cameroon.

[2] The part about Libya was prepared in September 2015 within the framework of the research performed by the Working Group on Migration of the Hungarian Academy of Sciences.

[3] In 2011, before the crisis 1 million Egyptians, 80 thousand Pakistanis, 59 thousand Sudanese, 63 thousand Bangladeshis, 26 thousand Filipinos, and 10,500 Vietnamese lived in Lybia.

Due to its demographic realities, Libya was in need of migrant workers as early as the beginning of the 1970s. Nevertheless, the number of sub-Saharan immigrants in Libya has increased from the 1990s onwards: the war between Libya and Chad ended in 1987; in 1994 an agreement was concluded about the free movement of citizens between the two countries; the Tuareg uprising in Niger and Mali came to an end (1995 and 1996) – these were among the factors that contributed to a more secure passage through the Sahara. Yet the main factor stimulating immigration was the announcement by Gaddafi of Pan-Africanism.[4] Gaddafi, who, disappointed by the reluctant Arab leaders, on several occasions openly encouraged the inhabitants of sub-Saharan countries to seek employment in Libya where, according to his promise, they would be accepted as "brothers" (Pastore, 2007). The open-door policy began to change in the 2000s as a result of pressure from Europe. In 2007 visa obligations were imposed on Arabs and Africans and the issuance of residence and work permits were tightened up. These measures resulted in 1.5 million migrant workers staying in Libya for a longer or shorter time becoming illegal immigrants overnight (Migration Policy Centre, 2013). In the 2000s this tightening up was followed by a wave of forced returns from Libya, the official reason for this being to "adapt" the number of the immigrants to the demand of the Libyan labour market. The majority of the people returned by force were unskilled citizens of sub-Saharan countries (HRW, 2006).

With the fall of the Gaddafi regime, racism against black Africans in Libya, especially aversion against black migrant workers strengthened. Since Gaddafi spoke up several times for black Africans, those people were considered the supporters of the system and after the 2011 revolution a "hunt" (Seymour, 2011) began against the black mercenaries of Gaddafi. Gaddafi in the 32nd Brigade, the commander of which was one of the dictator's sons, Khamis, had allegedly employed mercenaries from Chad, and Tuareg and Western Saharan Polisario warriors from the different countries of the Sahel Zone (IRIN, 2011) who had been infamous for their brutality against civilians. Following the death of Gaddafi, the brigade led by Khamis continued to commit atrocities against civilians in Western Libya, amounting to a wave of revenge in several regions of Libya against black people. In many cases, the victims were not native blacks but immigrants and migrant workers from Sudan, Eritrea, etc. (Joffé, 2013).

Although Gaddafi had considerable merits in creating and strengthening the Libyan national identity instead of tribal identity, the fall of his regime led to the whole Libyan society being reorganized (along Tripolitania, Cyrenaika, Fezzan and certain old costal towns) in the spirit of tribalism and regionalism. New fault lines emerged between the supporters and opponents of Gaddafi, who were seeking to secure the access to resources and contending for the lands donated by Gaddafi. Tribes, cities, and neighbourhoods founded their own militia in order to be able to represent their own interests even with the use of arms in the time of the general chaos. As central authority has virtually ceased to exist in a substantial part of the country since the middle of 2012, militia on their territories perpetrate arbitrary arrests, tortures, imprisonments and extrajudicial killings on their own territories.

Libyan society's racism against black Africans surfaced with overwhelming force under the revolution, and has continued to persist ever since then. By now the situation of black people has deteriorated significantly compared to the Gaddafi-era: in many cases the

[4] The objective of Pan-Africanism is to uplift the African people and create African unity.

outlaw and powerful militia draw on the racism of the local population in their actions. With the strengthening of the militia, and in the lack of strong central authority, nothing can stop the smuggling operations on the southern coast of the Mediterranean Sea (Marsai, 2015), as the more than 1700-kilometre-long Libyan coast is totally uncontrolled. On the other hand, conflicts between different Libyan groups result in regular clashes, which also forces foreigners living in Libya to flee (Marsai, 2014).

The fact that during the Gaddafi regime, the strong Libyan economy and labour market, based mostly on the oil industry, absorbed many black Africans bound for Europe and eventually made them stay in Libya through local job opportunities, now represents a specific challenge. Before 2011, Libya's oil production capacity was 1.7 million barrels, which by the end of 2011 shrank to 0.5 million barrels. As long as no consensus is established concerning the governance of the country, continuous disruptions in oil production may be expected. Since 2011 certain territories, especially oil extraction units, have been controlled by rebel groups (Krauss, 2013). The changes in oil production and in the political and security situation are well reflected by the pattern of volatile growth of GDP (2010: 5%, 2011: –62.1%, 2012: 104.5%, 2013: –13.6%, 2014: –24%) (World Bank, 2015).

Therefore, political uncertainty and chaos has a severe impact on the development of the economy: the number of unemployed people is growing which also acts to increase xenophobia. Nowadays, the Libyan labour market is unable to offer sufficient employment opportunities for migrant workers arriving from abroad (KPMG, 2014). Consequently, in the lack of strong central authority, in a country torn by strengthened tribal, regional, and city militia, human smuggling networks operate virtually undisturbed. The deteriorating security situation also has a negative impact on the economy: the shrinking job opportunities and the increasing racism against black people forces migrants to continue their journey to Europe.

Hereinafter, we examine the root causes of migration in the sub-Saharan African countries.

Factors in Sub-Saharan African issuing countries stimulating migration

The factors involved in stimulating migration in the continent may be summarized very briefly as follows:

- *There are no possibilities for decent livelihood* in the country of origin.
- *Dynamically developing young population* (third of the population is aged between 20 and 24) (UNFPA, 2012). Since, in the area, the working age population is estimated to increase by some 700 million persons between 2005 and 2050, this population explosion alone results in forced migration. On the other hand, the number of working age population of the developed world will decrease by some 88 million persons in the same period, so we may expect permanent migratory pressure in Europe (Búr–Tarrósy, 2011).
- *Political instability* (civil wars, failed states, chronic emergencies) or *repressive regimes* in the issuing countries.
- Changing climate, *desertification,* natural disasters.

- The *shrinking of good job opportunities,* the strengthening racism against black people and the disruption of the refugee status system in Libya forces the refugees and immigrants who move for economic purposes to go forward.

Some of the issuing countries are struggling with several factors stimulating migration which reinforce each other's impact. In the past decade, Sudan, South Sudan,[5] Somalia,[6] Mali,[7] and Nigeria faced internal conflicts.[8] However, in the countries of the Sahel Zone (including Senegal, Mauritania, Mali, Niger, Chad, Sudan, Eritrea, Ethiopia) desertification (the Sahara is expanding to the south, Lake Chad is drying up), the increasingly frequent droughts, the strengthening terrorist organizations (Ansar al-Sharia, al-Qaeda in the Islamic Maghreb, etc.), the drug and human smuggling networks all present serious problems.[9] Smuggling networks are free to continue their illegal activities in the sparsely populated, highly inaccessible territory of the Sahel Zone with less control by the state authorities or with no control at all. Repressive regimes rule, inter alia, in Eritrea,[10] Chad[11], and Ethiopia.[12]

The key to the African outward migration is probably the lack of economic prospects. Africa produced a dynamic economic development in the 2000s, becoming the world's fastest growing region; however, in several countries this did not entail significant job creation or increase in living standards. The African dynamism is the consequence of the prolonged coexistence of several factors. Several countries implemented macroeconomic measures, the political and economic institutions of the region have strengthened, and more Sub-Saharan countries are being stabilized. In this growth newly discovered raw materials have also played a crucial role: the developed economies' demand for raw materials increased and later, when this demand decreased due to the crisis beginning in 2008, emerging markets (including India, China, etc.) have made greater and greater demand (IMF, 2013). The dynamic economic growth in recent years has relied largely on the export of raw materials.

As a result of increasing raw material exports, sudden surging government revenues and GDP growth did not, in many cases, bring about any positive material change in the lives of ordinary people, as the rate of economic growth was not necessarily followed by the corresponding decrease of the poverty rate. This can be explained by the degree of inequality. It can be observed in some of the Sub-Saharan African countries that raw material revenues are controlled by a narrow layer of society, the rent-seeking elite.

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[5] They fought each other until South Sudan became independent—now the South Sudan Dinka and Nuer tribes are fighting each other.

[6] Failed states, with no functioning central authority, between 2009 and 2010 the most feared terrorist organization of Eastern Africa, the Al-Shabaab ruled most of the important cities in Somalia.

[7] The Tuareg uprising was followed by an Islamist takeover which resulted in a French intervention—the situation is still unresolved.

[8] In March 2015, Boko Haram, a radical extremist terrorist organization, ruled on a territory that is equal to that of Belgium.

[9] Indeed, landing in the "drug country" Guinea-Bissau, Latin American drug dealers transport their cocaine shipments through Western Africa and the Sahel Zone to Europe.

[10] The military service here forces citizens to life-long modern-day slavery and separate them from their families.

[11] Here Idriss Déby is determined to stay in power at any cost, which he seized 25 years ago and he is continuously fighting the "rebels" of the country.

[12] The party of president Hailemariam acquired 100% of parliamentary seats in May 2015.

Economic growth based on the sale of primary products also raises economic policy difficulties, for which the majority of Sub-Saharan countries do not have the appropriate institutional background and experience. At the same time, one of the most important findings in the literature on economic development is that development involves structural transformation. Poor countries that are capable of diversifying their economy can develop significantly, shifting from agricultural production and raw material production to modern economic activities, thereby increasing productivity and income. The rate of structural change determines whether a country is successful or unsuccessful (Gelb et al., 2015). In this respect, Africa is lagging behind the other continents.

Globalization has changed the way in which products and services are produced: instead of cross-country trade, a single product is produced in a number of countries (be it anywhere in the world) in production chains. The so-called effective engagement in global value chains is the only possible way of convergence today, because there is no time for imitating or deciphering the acquired technology – which used to be the proven recipe – because the methods used are changing and becoming obsolete too quickly. Today, countries "only" have to engage in an existing value chain, so in principle, countries with a lower level of capital and low technology can also have access to advanced technology and *know-how*, which would not have to been able to achieve all this without going through the stations of industrialization (growth, capital accumulation, development of a supplier network, etc.) (Szalavetz, 2013).

For the time being, however, Africa plays but a marginal role in global value chains. Existing trade rules, preferential trade agreements, which in principle give preference to the goods of the least developed countries, did not really improve the situation in Sub-Saharan Africa, since these conventions generally neglect the products in which the least-developed countries have the best interests. In many cases, rules of origin are so complicated and unfavourable to African countries (especially for products that are not wholly created in a beneficiary country), so that the actual use of the benefits provided is very low.

For the backwardness of Africa, therefore, migration destination countries are also responsible: trade agreements are formulated on the basis of the interests of developed countries and Africa only gets a marginal role in the global value chains. Strict rules of origin and narrower preferential clauses hamper the upward movement of the continent. If in the world economy Africa remains to be involved only as a raw material importer, we can expect an increase in economic disparities (Nafeez, 2004).

As long as local economies do not provide opportunities for the population, migration will continue to increase and, due to relative geographical proximity, of the most developed regions Europe remains its main target.

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Petra Pintér

Migration as a Security Risk and its Handling by the Governments of Hungary and Slovakia from the Viewpoint of Communication

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Abstract

With the global financial crisis and a recession-hit Europe, a coordinated safety policy is needed more than any time before. Humanitarian catastrophes surround Europe and the rise of terrorist groups can be observed. Hundreds of thousands of people are migrating from the countries of Africa and the Middle-East, fleeing poverty and war.

2014 saw more international conflicts than the previous years. This resulted in a rise in migration, especially towards Europe, with more than 100,000 people trying to enter the European Union in the first six months of 2015 through Italy, Hungary and other border countries, and in total more than 1,800,000 migrants and refugees crossed into Europe in 2015 (Frontex, 2017a). Under these circumstances European relations with International parliamentary institutions (IPIs) and regional alliances are even more important than they previously had been.

The four countries on the Eastern border of the Schengen area, Poland, the Czech Republic, Hungary and Slovakia form the regional alliance of Visegrad 4 (V4) countries. Such cooperation is extremely powerful, especially with Donald Tusk from Poland being the President of the European Council since 1 December 2014. These countries are especially exposed to illegal immigration. Hungary alone sees more illegal immigrants than any other European country. With the Dublin III agreement (604/2013/EU) including the EURODAC rules, under some circumstances illegal immigrants can be sent back to the country where they were first registered by the authorities. Finally, Hungary decided on building a Security Fence along its border with Serbia in order to prevent illegal immigration from outside the Schengen Area.

The European Commission's first proposal to regulate asylum and immigration through a quota system among the EU member states caused conflicting reactions on part of the governments. How have the V4 acted in this special case and how do they join their forces in cases of such political issues? And how have the governments of Slovakia and Hungary

communicated the issue of migration to their citizens in order to lower the security risks connected to the mass migration?

With a large-scale migrant crisis unfolding on the EU's doorstep and insufficient support for the Commission's proposal of the burden-sharing mechanism among member states, a short-term solution is necessary to win Brussels time to create a long-term strategy. This paper will address the partnership and mutual acting of the V4 countries within the EU regarding the current issues with a critical explanation of results and goals, with special emphasis on how the migration challenges were addressed and communicated in Hungary and Slovakia by the governments of these countries.

Keywords: safety, safety policy, immigration, migration, asylum seekers, communication, social media, Visegrad Four, Hungary, Slovakia

Research

Mass migration threatens several dimensions of safety. On the one hand, it constitutes a military threat as at its root are countries torn by wars and civil wars; on the other hand, terrorists can gain access to the territory of the EU unchecked so there is a risk that they will commit terrorist acts within the EU. Those who arrive *en masse* due to a shaken sense of security may jeopardize political security and may change the economic dimensions of safety in the host countries. Because of their different culture they may undermine the social dimensions of safety as well if the integration process remains incomplete, and since terrorist acts are often organized via the internet, even cyber safety may be jeopardized.

In the year 2014 we witnessed more international conflicts than in the previous years altogether, as a result of which illegal migration has dramatically increased, in particular toward Europe, with 1.8 million new arrivals in the year 2015 (Frontex, 2017a). The majority of them tried to get into Europe through Italy, Greece or Hungary (Frontex, 2015). In these circumstances, transnational cooperation became a priority and the same is true of regional cooperation as well.

At the eastern boundary of the Schengen area, in the context of their cooperation, Poland, the Czech Republic, Hungary and Slovakia, i.e. the Visegrád Four, tried to exert serious pressure on European policymakers. Their collaboration has been successful in many cases— in which it may be an important factor that since December 2014 the president of the European Council has been Donald Tusk from Poland, who is capable of giving more weight to every action proposed by the V4 using his personal influence within the EU.

Because of their geopolitical situation, the Visegrád countries are particularly exposed to migratory pressure. Only in 2015, Hungary registered more than 330 thousand illegal border crossings (Police.hu, 2017). In that year the number of first-time asylum seeker applications was the highest in Hungary among the EU countries: 1770 per 100 thousand inhabitants which is three times that of Germany (540) and seven times the EU average (250) (Eurostat, 2016). Finally, Hungary decided to stop the flow of migration by building a security fence along the southern border with Serbia. This fence is not meant to reduce the migratory pressure but the scale of illegal immigration—the applications of people coming from third countries officially entering Hungary and applying for asylum are still processed smoothly, officially and according to all international regulations and standards.

In line with the Schengen requirements, this process protects the external borders and is meant to reduce the scale of illegal immigration.

The first proposal of the European Commission for managing the migratory pressure was the quota system which would have allocated asylum applicants among the member states of the EU. This process, however, which reflects the spirit of solidarity of the EU, raises the questioning of the nation state level decision-making power of member states. Member states which, due to the migratory pressure, had to guarantee the inclusion of immigrants in a higher proportion according to the framework of the Dublin III agreement, have joined political forces in order to make their voices heard even better among European decision-makers. Nevertheless, with the intensification of the flow of migration it became evident that the earlier quota numbers were not sufficient for the allocation of all the refugees even at the time of their adoption. The Schengen border states would have liked to manage the situation at nation state level as well and explain to their voters how the immigration pressure and the quota system proposed by Brussels affects them from the point of view of safety policy. Therefore the V4 countries acted jointly while managing the situation from the point of view of national policy. In my study, I investigate this dual system of measures.

Lately, the international community has been experiencing a level of migratory pressure which has no precedent since the establishment of the office of the United Nations High Commissioner for Refugees (UNHCR). This was induced by the global financial crisis and its aftermath, the wars and uprisings in the Middle East and North Africa and the resurgence of the activities of non-state actors and terrorist groups which were only topped by climate change. These factors all led to the deterioration of the human rights situation and forced hundreds of thousands, even millions of people to flee their homes.

In order to deal with such international issues, sovereign states must cooperate to find efficient solutions, to formulate strategies and to develop joint action plans. For such transnational cooperation, joint work plans have been developed, a decision community has been formed in order to enable member countries to articulate their position more efficiently than the nation states alone. This is particularly true of the EU which is one of the most efficient political actors of the world and is based on a broad consensus.

Main results

Over the last years, humanitarian disasters which surround Europe culminated in a flow of migration whose main target was Western Europe, Germany in particular (Frontex, 2017b). Migration generated heated debates throughout Europe: even the semantics describing the situation implied a judgment in itself and the incomplete or independent legal system permitted to different interpretations as well as to abuse.

As the transit states of the Mediterranean migration route, the countries situated at the eastern border of the Schengen area faced great exposure and a high safety risk. In order for them to be able to comply with the obligations set out in international treaties, the Schengen states had to introduce emergency measures: one of them being the safety fence built along the Hungarian–Serbian border, whose technical measure was reinforced by further personal and legal instruments.

Since the approach applied by Brussels and Berlin for managing the migration situation was different from what the other member states took, it became important at the international level that cooperations like the V4 could effectively state their unified positions. The EU's draft measures were far behind reality and Hungary—which experienced the pressure of migration on a daily basis—in partnership with the other three Visegrád countries was able to effectively articulate its position and enforce their common intention.

In the V4 countries, however, emergency measures had to be explained to the local voters: in our studies it could be observed that Slovakia and Hungary handled the situation in a very similar way from the point of view of communication. It should be noted that government communication can never ignore the characteristics of its country and the traditional attitudes toward certain issues: the explaining-orienting opinions underlined by the government only correspond to its voters' assessment of reality, otherwise the communication and opinion orientation would not be effective. Therefore, thoughts appearing in governmental communication may only express voters' existing attitudes and they certainly do so in the cases under examination.

From a political point of view, in both countries under examination the governments successfully took over the roles of case officers while the opposition and the extreme right were unable to formulate substantive and effective messages. Traditional media had the greatest effect on the voters; however, in Hungary an organization that was an online grassroot organization was even able to collect enough resources for a traditional poster campaign. Opposition parties not only failed to influence the assessment of the issue, but they even resorted to using the terminology originally established by the government.

In the given circumstances, from the point of view of safety policy the management of the migration crisis was effective and efficient: V4 member countries drew attention to the security challenges linked to migration and proposed meaningful solutions the majority of which were adopted in Brussels over time. Building the border barrier also addressed the legal shortfalls, and afterwards the number of illegal border crossings fell sharply. The legislative changes were appropriate and well-founded, and the communication of the government met the voters' existing beliefs and experiences.. As a result of the EU's decision-making practice, member states may not interfere with other countries' decisions; however, they may exert pressure, either by way of national consultations, referendum or inter-parliamentary associations.

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Éva Tokaji-Fazekas

Pakistani Citizens' Escape Reasons from a Climate Change Point of View Through the Example of the Kashmir Region

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Abstract

The aim of this chapter is to monitor the effects of migration to the European Union, primarily to Hungary caused by, among other things, climate change, in relation to the Pakistani citizens from the Azad Jammu and Kashmir province of Pakistan, as well as its future impact on the European Union and Hungary.

First I analyzed the main reasons of the Pakistani refugees for seeking asylum and their number among the total number of asylumseekers. The first part of the paper presents some statistics made available by the institutions of the European Union and the Hungarian authorities. In the following part of the publication the history of the Kashmir Region is presented, followed by the problems based on the religious and economical background of the conflict. Unemployment and overpopulation are the two most serious economic problems of the regions.

In the third part of the study I introduce an overview of the problems created by climate change in Pakistan, in particular the Kashmir Region. Based on the above-mentioned problems, I conclude that we will face a new, ever increasing wave of migrants from Pakistan, and its Azad Jammu and Kashmir province in the next decade.

Keywords: Kashmir, Pakistan, climate change, over-population, water conflict, religious war, unemployment, migration, refugees

Preliminary remarks

Over the last few years, almost every day we could hear about migration from the Asian and African continent to Europe, which became massive in its scope after the events of the Arab Spring in 2011. The management of migration challenges is increasingly urgent for the organizations and offices dealing with migration issues. At the state, regional and expert meetings and discussions, it became evident that problem-solving at the European level should not specifically address the resettlement of the refugees arriving here but primarily about exploring the root of the problem and its handling which in this case means the effec-

tive responses to wars, economic problems and climate change. In this publication, I study one of the segments of the above: the migratory flow that affects Hungary's safety, narrowing down the problem to one country of origin, in particular reflecting to its climatic reasons.

In the background of the migration of Pakistani citizens from the Kashmir region there are mainly ethnic, religious and safety problems. Since the British withdrawal and the evolution of new states, the region is characterized by continuous tension. For the time being, it is rich in water resources, however, the distribution and treatment of water is problematic. Religious reasons – the majority of the population of Pakistani-controlled Kashmir is Muslim – provide a basis for the conflict which have not been settled satisfactorily by the leaders of the states in the region. The other factor contributing to the conflict – as another root cause – is the climate change whose negative tendency exacerbates the situation: due to the water conflict the region's safety is becoming more unstable, therefore people who live there flee their homes because of the conflicts and the unliveable environment.

In the last few years, Hungary has been affected significantly by the migratory flow. According to the European Union statistics, Pakistani citizens ranked 4th regarding filed asylum applications whereas according to Hungarian data they ranked 2nd. Our country is apparently very much affected by the migratory flow from Pakistan, so I consider it important to shed light on the causes by which Hungary can prepare for not progressively reducing migratory pressure.

Pakistani illegal/legal border crossers in Hungary and in the European Union

Between 15 September 2015 and 12 June 2016, the number of asylum applications filed in Hungary was 19,697[1] of which 2988 persons were Pakistanis. In the nationality rankings of the applicants, Pakistanis are in the 2nd place. Analyzing the statistics submitted by the member states of the European Union we can see that Pakistani applicants appeared in significant numbers in front of the asylum offices of the member states. In case of Pakistani applicants, the ratio of both the recognition as a refugee and as someone being eligible for subsidiary protection is particularly low while the ratio of the rejected is significant,[2] since in Pakistan none of the reasons listed in the Geneva Convention as a basis for refugee status exist (Eurostat, 2016a; 2016b; 2016c). Specifically in this regard no statistics have been compiled neither by the Eurostat, nor at the Hungarian Immigration and Asylum Office, though the latter has a data base which collects the answers to questions relating to the countries of origin according to which people who arrived from Azad Jammu and Kashmir mentioned religious tensions and armed conflicts as the reasons for their flight.

[1] The official statistics of the Immigration and Nationality Office sent by e-mail.

[2] According to the statistics of the EU member states, in the final quarter of 2015, as regards for Pakistanis, the 27% of the applicants are provided with some kind of protection.

Kashmir

Figure 1
The Kashmir region

Source: Miehle et al., 2012: 90.

The administrative parts of the Kashmir region: Azad Jammu/Northern Areas (as part of Pakistan), Azad Jammu and Kashmir (as part of India), and a smaller area of the region that belongs to China.

The historical roots of the conflicts of the Kashmir region

The discord between India and Pakistan has been the trigger for three serious armed conflicts, two of which was fought for Kashmir. Kashmir consists of the Azad Jammu and Kashmir region at the north-west of the Himalayas, Ladakh, Baltistan, and Gilgit. British India, as part of the British Empire, in 1947, at the dissolution of the colonial empire, was split into the Hindu-majority India and the Muslim-majority Pakistan. Jammu and Kashmir princely state with a special status was an exception from this division, having a Muslim-majority population and Hindi leaders headed by Maharaja Singh who preferred to become independent and remain neutral between the successor dominions.

In October 1947, Pakistani-supported armed forced invaded the Kashmir region. The maharaja asked for a military support from India and immediately joined the Indian Union and let Delhi take control of defence, transport and foreign affairs. Pakistan opposed this step and declared it unlawful since according to Pakistan the maharaja ignored the will of the Muslim community, constituting the majority of the population. So Pakistan sent armed men into the region. In order to prevent the outbreak of the war, the UN mediated between the parties, which resulted in a ceasefire in January 1949 and the delineating of a temporary border line which the parties mutually recognized: almost two-thirds of the total area of approximately 223 thousand square metres – together with the capital Srinagar – came under the direct rule of India, while slightly more than one-third of the area was brought under Pakistani administration. Muzaffarabad became the capital of the Pakistani Kashmir area, and the region got a new name: Azad Kashmir. In 1957, despite the fact that the larger part of Kashmir was under its jurisdiction, India annexed the whole region by renaming its own region (Jammu and Kashmir), defying thus the decision of the United Nations Security Council (Wilhelm et al., 2016).

The next episode of the conflicts affecting the two countries was the construction of the highway of strategic importance in 1959, which was started by China, during which Chinese troops entered the north-west part of the Kashmir region and occupied the Aksai Chin plateau of Ladakh which belonged to India and also a strip of land that belonged to Pakistan. The next event was the Sino-Indian War in 1962 which was lost by India. "For the time being, 45% of the former Jammu and Kashmir princely state belongs to India, one-third to Pakistan, and the remaining part is controlled by China. Their aggravated conflict escalated into open warfare again in 1965 and 1971. As a result of the latter, Bangladesh got detached from Pakistan" (Terasz, 2001).

The economic conditions of the region

Pakistan is traditionally an agricultural country: agriculture is accounting for 21% of the GDP and employs 45% of the total workforce (Ministry of Finance, Government of Pakistan, 2011). This is outperformed only by mining and the textile industry within the industrial sector (Economy Watch Content, 2010). The 62% of the population lives in rural areas thus it is directly or indirectly linked to agriculture. The water, which is important in terms of agriculture, is available in this region in abundance through the rivers arriving from the Himalayas, however, in addition to the warm weather in the southern provinces the biggest problems are caused by the significant amount of rain, the plunging rainfall and water scarcity (Sarwar, 2014). The dwindling water that is delivered from the northers rivers to the south through the drainage system provides for 90% of the water demand of the Pakistani agricultural lands. This is the biggest challenge for Pakistan's agriculture since the rainy period occurs during monsoon; however, lately these periods were characterized either by major floods or low rainfall.

Figure 2
The Indus River System

Source: https://dineshdhapudkar.wordpress.com/2015/09/22/drainage-system-of-india/ (23.05.2016)

In the Kashmir region, however, big streams that take their sources from the Himalayan glaciers provide safe water supply for Pakistan as a whole, but despite the system of sewerage of sewerage there are only a low number of water reservoirs in the country, therefore plenty of fresh water enters the Arabian Sea unutilized. The valley of the Indus branching off from the glaciers in the Himalayas is shared by several countries: Pakistan enjoys the utilization of 60% of the river's catchment area, while India has only 20%, according to the *Indus Water Treaty.* In the water treaty signed in 1960 Pakistan and India shared the use of the Indus river system and the limitation of water yield (World Bank, 1960). The parties more or less adhere to the agreement; however, based on its content, Pakistan's fear has been confirmed namely that in case of war India can turn off the tap (Sayfo, 2009).

The melting of glaciers of the Himalayas has accelerated, too. Some researchers believe that at the current pace of climate change (Grossmann, 2015) by 2035 glaciers would melt as a result of which, for example, Pakistan would practically be left without drinking water. Due to the melting of the glaciers, certain cities and regions suffer from depopulation which process has already begun. The inhabitants of the affected areas will become internally displaced people or, according to pessimistic Pakistani scenarios, due to the warmer and more unbearable climate, set off in the direction of other continents.

In Pakistan, unemployment has been around 6% for years. As regards to local wages, I would mention the basic salary of unqualified employees at the bottom of the wage pyramid which is 12-13 thousand Pakistani Rupees per month (Paychek, 2016), equalling about 150 Euros.[3] Regarding unemployment, a factor worth mentioning is population growth. According to the prognosis of the experts, the population of Pakistan will rise from the current 188 million to 300 million by 2050. The country is the 5th most populated in the world, and according to projections it would retain this position until 2050 (Express Tribune, 2015). Taking into account the negative effects of climate change, the unemployment rate would rise leading to social tensions and further exodus.

Due to the low wages and mainly to the limited economic opportunities of the underdeveloped northern areas, people living there headed to economically developed countries to look for better opportunities. Active Pakistani employees work in large numbers in the Middle East and in Europe. Pakistani migration to Europe began in the 1950s. During that period the migrants' priority target was Great Britain: the constructions starting after World War I absorbed the newly arriving workforce, primarily coming from the Kashmir region and Punjab. At that time, for physical work people were not required to have appropriate qualifications, and primarily hard-working young men were needed by the British economy who were willing to work for low wages. Migration continued In the 1960s: by that time qualified or more educated Pakistanis had migrated to Great Britain and other states of Europe – primarily to Germany and the Scandinavian countries – within the framework of legal migration (Yousef, 2013). Pakistani migrants arriving in the recent period choose Europe as their place of residence due to conflicts and economic problems. This third migratory wave primarily takes place illegally, with the help of human smuggler networks. Some of them file asylum applications or enter the Schengen area legally, as a tourist or with student visas and after their residence permit expired they stay in Europe illegally (Yousef, 2013).

Climate conflict in the world and in the Kashmir region—conclusion

One of the primary concerns of the climate change, which has been accelerating in the last decades, is water scarcity and the inadequate distribution and treatment of water. Two-thirds of the Earth's surface is covered by water which is a constituent of the atmosphere as well. Fresh water in the polar icecap amounts to 3% of this water supply (1.4 billion km^3) and only the remaining 0.5% is the available fresh water. So, as regards of its water supply, the Kashmir region is considered a great power – until the complete disappearance of the glaciers – which was realized by the powers that share the region.

[3] www.x-rates.com/calculator/?from=PKR&to=HUF&amount=12000 (10.06.2016)

"The next war in the Middle East will be fought over water, not politics,"[4] said Dr. Boutros Ghali, the then UN Secretary-General back in 1985 (BBC, 2003). This famous saying proved to be all too accurate, if we consider the recent events, including the Syrian war whose root cause was seen by experts decades ago the water crisis underlying the increasingly tense religious issue. According to the mean temperature data available for Pakistan and the rest of the world, temperature has risen sharply since 2000.

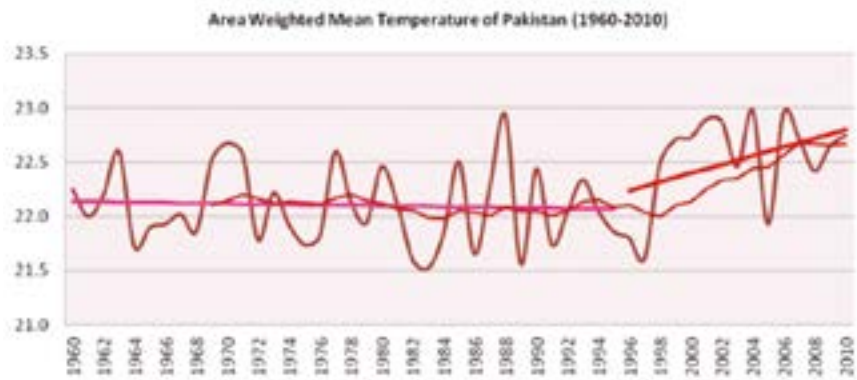

Figure 3

Weighted average temperature data in Pakistan between 1960 and 2010

Source: PMD (2012)

In the last decade, researchers observed warming on the territory of Azad Jammu and Kashmir as well and in this context raised awareness of the already mentioned glacier melting. In the light of the above, it can be said that environmental problems will generate further conflicts and regarding the already arisen conflicts further escalation can be expected in the currently unstable countries and regions as regards safety, as a result of which hundreds of thousands or millions of people will be forced the flee their homes.

Population growth breaks records: to date, Asia is the most densely populated continent, 60% of the Earth's population live here. The African population is growing fast, too: between 1975 and 2000 the continent's population nearly doubled to almost 811 million people, and researchers predict 2.2 billion inhabitants by 2050 in the economically underdeveloped areas which are most exposed to climate change. Consequently, millions of people are expected to leave the region in hope for a better life towards North America and Europe, including Hungary. Our country is currently considered a transit country; however, as Northern and Western European countries, which are in economically better positions, become saturated and social benefits provided for the marginalized mass of people are to be cut, Hungary may as well become a target country. For the reasons stated above – population growth, unemployment, armed conflicts due to water, unbearably warm periods – before long from the southern parts of Pakistan, and sooner or later from Azad Jammu and Kashmir regions in the northern part of the country as well, an increasing number of illegal migrants and asylum applicants are expected to arrive to Europe, including Hungary.

[4] "The next war in the Middle East will break out because of water and because of politics."

Based on the experiences gained in the last few months, it can be stated that the authorities of the European countries cannot filter out from the people arriving *en masse* those who fall within the scope of the Geneva Convention, nor can they solve the resettlement of the asylum applicants in the short term and their integration in the long term. In my opinion, the solution at the European level could be a peace process supported by the great powers of the world and the development and implementation of a climate plan with the involvement of the affected countries. The full completion of the peace process is only possible if all the problems are solved and not only managed symptomatically. Therefore, besides ending the war situation, it is necessary to resolve the ethnic and religious conflicts with an agreement between the parties and later to reduce the effects of the climate problems at the root of the conflicts which process may last for decades.

Resulting from the symptomatic treatment currently applied, we must be prepared for a new and even bigger migratory wave within one or two decades from Asia and Africa, and the number of the newly arrived might reach the current population of the European Union, approximately 500 million people.

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Noémi Katona – Tamás Bezsenyi

Limitations and Possibilities of Countering Human Smuggling. Analyzing the investigative work of Hungarian authorities

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Abstract

Migration is among the most important challenges Europe has to face nowadays. Combating human smuggling networks facilitating illegal migration is, therefore, of key importance in the internal and external politics of both the European Union and the nation states.

Based on our research project financed by the European Union fund and conducted in 2016 and 2017, we intend to present how the Hungarian National Bureau of Investigation within the Rapid Response Police explores and investigates transnationally organized human smuggling networks. Examining the organizational characteristics of domestic law enforcement agencies, we focus on the methods used by the law enforcement system in order to explore smuggling groups operating as parts of a criminal network. Considering the issue of cognitive constraints as highly important, drawing on investigation theory we can hope to explore the cooperation and information flow within the existing organizational framework of law enforcement.

Keywords: transnational organized crime, human smuggling, theory of investigation, police organization, forensic science, Europol

Introduction[1]

The phenomenon of migration has extensive literature as it can be examined from political, economic, anthropological, psychological, and many other aspects. It is therefore difficult to simply define this complex phenomenon, but the definition of migration usually focuses

[1] This study was funded by the EU within a research project led by the NUPS Faculty of Police Science (FPS), coordinated by the MoI within the framework of the Internal Security Fund, looking at the investigative work on organized crime from an information flow aspect.

on human behaviour, change of place of residence or modification of the social capital (Hautzinger et al., 2014). The wave of immigration to Europe is also a phenomenon widely covered in the media in the past years and decades. Migration-based human smuggling has also become the focus of not only the authorities but also public attention. Despite this, we do not have a clear picture of its actual extent, due to the forced limitation of statistical data on immigrants (Heckmann, 2004) and the latency typical of human smuggling in the form of international organized crime.

Researchers try to explore human smuggling based on a variety of sources, so the phenomenon can be examined from angles of sociology, political science and criminology. On the one hand, judicial, police and border statistics are important sources. On the other hand, interviews with immigrants and experts, such as social workers dealing with immigrants, representatives of immigration offices and police officers, can be used as sources. Finally, court sentences and investigative documents on human smuggling are a prime source. Different sources provide opportunities for different analyses and highlight the mechanisms and nature of smuggling in different ways (Heckmann, 2007). The aims of the sociological analyses include presenting the structure, social organization and dynamics of the smuggling networks, which emerges from the relationship between the prison service and the smuggling network. In addition, the relationship between smugglers and immigrants and the presentation of migrants' mindset are subject of examinations. Political science examinations, on the other hand, focus on the relationship between migration policies, prison service and the functioning of smuggling networks. Criminological approaches specifically focus on action against smuggling, both in terms of criminal law and criminology.

In our research, we primarily want to analyze the investigative work related to human smuggling. Our aim is to point out the organizational and sociological analysis of criminal investigation and police work to identify the possibilities and limitations of countering human smuggling. The significance of the analysis is that, unlike legal and political research, it shows the applicability of concrete legislation, the everyday reality discovered or experienced by the investigating authority, against statutory law. Criminal substantive law acts in the general context of continental jurisprudence as texts of normative legal regulations (Varga, 1998: 283), the enforceability and the nature of which appears in the scientific literature to a rather limited extent (Bócz, 1998: 128–139.). We wish to show how the national agencies of criminal prosecution, primarily the National Bureau of Investigation (NNI), having the legal status of a separate directorate under the Raid Police, detects and investigates internationally organized human smuggling networks. We attach great importance to the ways in which the law enforcement organizational system acquires information on smuggling groups working covertly. Although criminal methodology has considerable literature, this approach is marginal, or completely absent in the discourse on migration and smuggling of people. Additionally, the analysis of the specific investigative work related to the crime has also been little explored. In our study, we hope to contribute to this, and by presenting ways of co-operation and modes information flow between investigative theory and law enforcement organizational frameworks, we wish to take into account the cognitive barriers to human smuggling and the opportunities for overcoming them.

Human smuggling as organized crime

The most important foreign policy issue in Europe today is the wave of refugees coming to the European Union. Although this phenomenon is not given top priority in the public discourse, but in the wake of the increasing wave of migration illegal economies have grown strong. People smuggling is one of the lucrative branches of organized crime even without the presence of acute political risks and it is a major challenge for modern law enforcement agencies, which are the emblematic products of the modern nation states that prefer disciplining society, according to Foucault (2000: 287–305). At the same time, the borderline between legal and illegal migration can be problematized in several aspects (Hautzinger, 2015) and different foreign and immigrant responses have been created to deal with the immigration wave. Regardless of whether the authority treats foreign citizens appearing at the border as illegal immigrants, as impostors or as asylum seekers, they all use the services of criminal groups and smugglers promoting their movement. However, the point at which activities facilitating migration are considered to be punishable also raises questions. As pointed out in the Helsinki Document (2015), the boundary between humanitarian aid and the smuggling of human beings is not clear for many. The transportation or facilitation of the movement of migrants is also punishable, but the intention to gain profit is also a qualifying circumstance in the case of smuggling. In addition, smugglers often hide their activities behind their legitimate businesses, and this makes it more difficult to detect their illegal operation (e.g. they disguise the coordination centre of people smuggling as a travel agency) (Leman–Janssens, 2012).

The crime of people smuggling is thus international by its very nature, so international cooperation is of the utmost importance to counteract it. The basis for this is created by uniform legal conventions that define the phenomenon on the one hand, and on the other hand define the possibilities for joint criminal action. The international conventions on organized crime have a greater history and are preceded by a number of conciliations (Bezsenyi, 2015). The document currently defining the various offenses of organized crime is the United Nations Convention against Transnational Organized Crime, signed in Palermo in December 2000, which entered into force on 29 September 2003. In Hungary, the concept of smuggling of human beings was first published in the Criminal Code in 1961, Section 204 contains its statutory definition in the chapter on crimes against public security and public order (Mayer, 2014). It was later amended several times, partly because of the implementation of international conventions (Hautzinger, 2015, Gaal, 2005, Mayer, 2014). At present, the Criminal Code defines criminal offenses related to smuggling in several paragraphs: criminal act of human smuggling (CC, Section 353), the promotion of illegal residence (CC, Section 354) and the abuse of establishing family relationships (CC, Section 355). In addition, in 2015, the legislator introduced the statutory definitions for the unauthorized crossing of the border barrier (Section 352/A) and the damaging of the border barrier (Section 352/B), which provide for punishing just those crossing the border, thereby abandoning the detection of the organization behind the action.

Hungary has a key role in dealing with human smuggling and illegal migration as a country bordering on the Schengen area (Kovács, 2015). Our country appears as a transit country in relation to illegal migration routes and networks, as HNPHQ Instruction No. 21/2008 also states. Thus, citizens of countries facing economic difficulties move to coun-

tries functioning as destination countries with a relative advantage, mainly to Western European via our country. Several years of work by Anti-Illegal Migration Department of the NBI (AIMD, formerly MMD) supported these findings. Accordingly, international cooperation against smuggling of human beings is also crucial in Hungary, partly supported by the European Union, given the resources provided by the SOCTA *(Serious and Organized Crime Threat Assessment)* and other funds, as reported by a member of the investigating authority.[2]

Smuggling is generally a crime committed by organized crime groups. On the one hand, groups active in Hungary are of foreign origin (primarily Kosovar, Albanian, Serbian, Ukrainian) and Hungarian citizens, who usually only form the lower echelons of the larger international network. The structure of the smuggler networks and the different roles (supplier, walker) have been studied (Neske, 2006). In Hungary, therefore, basically the lower legs of smugglers' networks, the easy-to-replace persons can be apprehended, while the main organizers live in Serbia, according to our interviewees, and typically do not cross the country's borders.

Due to the regulation of international criminal prosecution, the Hungarian investigating authority is primarily able to investigate crimes committed in the territory of the country or committed by Hungarian citizens, which is why it is possible that it can only act successfully against the middle and lower levels of the human smuggling networks. This fact also underpins the need for international co-operation, as the penal institutions of each nation state can cut off only one head of a dragon-like network, but they can only kill the dragon itself through joint action (Heckmann, 2004). The basis for this cooperation is the effective and rapid liaison between the different national investigating authorities. Its important institutions are legal assistance and JIT (Joint Investigation Team), but actually they often slow down communication. On the other hand, the investigating authorities have succeeded in using the various national liaison officers as well as the CCP-s (common contact points) along the borders.

Investigative work on human smuggling in the European Union and Hungary

Crime related to human smugglers was investigated in Hungary by the detection and criminal investigation departments of the border guard until the integration of the police and the border guard in 2007 (Kovács, 2015). Investigation of trafficking in human beings was given more emphasis by the National Bureau of Investigation in 2004 and after the integration mentioned above. Thus, the official action against human smuggling has also been transferred to the NBI within the current Raid Police. Due to the accession to the European Union's Schengen border and the necessary law enforcement work, HNP HQ instructions were issued to clarify the tasks related to the investigation of human smuggling (e.g. HNP HQ Instruction No. 21/2008). For the Department of Major Migration[3] at the Organized

[2] Interview with an investigator of the AIMD, interviewer: Noémi Katona (2016. 08. 17.).

[3] Based on the current regulations, it continues to work as the Illegal Migration Department of the International Organized Crime Division

Crime Division of the National Bureau of Investigation, the above-mentioned HNP HQ Instruction also called for intensification of international criminal cooperation as an effective solution to the smuggling of people. Unfortunately, this instruction structures policing tasks in such a way that after defining the general objectives it continues with the control and the use of technical equipment and then mentions terrorism as a potential threat. In the instruction, information gathering activities only come as the last but one point before the summary statement, although in the absence of the decentralized organizational units necessary for the control of the internal and external borders and for the in-depth control, it would have been more important to focus more on the human intelligence line. However, last year RRP NBI Criminal Intelligence Department[4] was created partly due to the growing number of migration issues.

The need for cross-border investigation was not only justified by the implementation of modern European law enforcement, but also by the fact that while the Criminal Directorate dealing with illegal migration within the Border Guard had a staff of 444, only 35 police officers continued after integration, working in the NBI against groups of human smugglers (Boross, 2009: 91). They were only able to rely on the detection departments and border police field offices of the border counties. By 2011, the police only partially corrected the staffing level of units involved in investigating crimes related to human smuggling, as a total of 72 people worked in some organizational unit (department, sub-department, team) in countering this specific type of crime (Boross, 2011: 29.). At present, only 25 officers work in this department and they use a lot of intelligence gathered by the criminal intelligence departments and border police field offices of the county police headquarters. The low number of staff and the resulting increased workload largely determine the effectiveness of countering human smuggling.

The detection and investigation of human smuggling

The Act on Criminal Procedure[5] regulates the procedures but does not systematize the various forms and antecedents of investigations into specific types of crimes, such as human smuggling. Criminal acts and groups of offenders may come to the knowledge of the authorities in several ways: 1. requests for legal assistance from foreign authorities; 2. own detection; 3. external detection; 4. based on the emergence of a new offender.[6]

Investigations on trafficking in human beings are the least frequent in the form of a request for international legal assistance by a counterpart authority in a foreign country, in which case the public prosecutor notifies the investigating authority of the request for legal assistance. In the second case, the investigation starts with the authority's own detection. There are two subcategories of this: when they stumble upon the operation of a group of people smugglers during everyday intelligence work and take "immediate" coercive measures

[4] The Department has separate Intelligence, CID, Information and Prison and Custody Suite Intelligence Sub-Departments.

[5] Act XIX of 1998 on the Criminal Procedure and its subsequent amendments.

[6] A The typology was created by Lieutenant Colonel Zoltán Boross, a member of the National Bureau of Investigation Office of the Rapid Response Police, as a result of the investigative work of the head of the Illegal Migration Department.

to interrupt the act; or when surveillance is carried out in the context of covert information gathering – this is separated from the former, rather spontaneous version, by being very organized and targeted. The third version is to commence the investigation when detecting acts of human smuggling on the basis of external perception, that is, signalization by police, border police or, possibly, in-depth stop and search operations. This also includes reports by members of the public, or notices or reports of other authorities or foreign agencies. In these cases, the most important thing to do is to decide on how to proceed, i.e. decide on refusal to investigate, on supplementing the initial inquiry, or initiating the investigation. The fourth option is the initiation of investigation based on the emergence of a new offender. Due to a new offender arising from procedure underway for different reasons, it may be worthwhile to separate the act in question from the case in the main procedure. An example may be the presence of a smuggling organization in a drug trafficking investigation that may justify the separate processing of potentially discoverable and demonstrable illegal smuggling.

The smuggling investigations initiated in these ways will be determined until the end of the procedure, in many cases until the final judgment by the detection framework in which the case is initiated. Intelligence from the observations of patrol officers mainly affects the lower levels of the smuggling network and limits itself to one or two acts, so it is primarily the transporters or walkers. On the other hand, in the case of investigations initiated by own intelligence and often through legal assistance, the investigative authority focuses mainly on the middle and upper levels of smuggling networks, and their previous criminal acts may also be included in the indictment.

Human smuggling cases almost never involve sole perpetrators, so the investigative authority has a crucial task to find map out the network of offenders. For this reason, the examination of the offenders' communication is also crucial for the exploration and the proof. In this context, the difficulty of interpreting with which the investigating authority is faced, and which requires additional time and resources is highlighted. In addition, there is a difficulty in the investigation that, in contrast to trafficking in human beings, asylum seekers and smugglers have a shared interest, and the asylum seekers' participation in the procedure cannot be guaranteed in the long run, their testimony can often be of limited usefulness for the procedure.

Evidence of human smuggling: physical and personnel evidence and procedural acts

Due to the aforementioned difficulties, it is mainly the allegations made by the suspects that can be considered personal evidence. The investigating authority uses special interview and investigative techniques[7] to make the various members of the given criminal network confess or make incriminating statements on one another, or to have pieces of information to succeed in making them confess.

[7] In addition to simultaneously interviewing the suspects and the asylum seekers among the potential offenders, the real danger is that the investigative authorities intercept telephone conversations in a foreign language, the contents of which will be communicated weeks later by a translator, and by tracking information on cellular phone communication and by conductiong surveillance operations the investigators track events whose outcome is dubious, because the so-called "sound bites" of wiretaps provided by the NSSS cannot help either.

In addition to personal evidence, material evidence is very important, which is partly gathered during procedural actions (house search, seizure of a motor vehicle). As we have mentioned in the four different cases, the execution of different procedural actions differs in the degree to which they are planned or spontaneous. If CIG (covert intelligence gathering) preceded the investigative work, the execution is always planned, and to ensure successful completion of the case the time and mode of execution is determined by the investigative plan.

Important material evidence is the retrieval of the wire transfers mentioned earlier (through which the various roles in the network can be investigated) and the telephone wiretaps carried out by the investigative authority during CIG and CDA (Covert Data Acquisition). For the sake of proof, this is partially de-classified, but the difficulties arising from interpreting are also raised here, and its time requirements are a great disadvantage for the investigative authority. In order to prove the legal classification of a criminal offense, it is also essential to reveal communication between members and to gather relevant evidence. Other important material evidences are data on the route and the transport, which are largely due to various vehicle registration data requests and toll registers.

In addition, proceeds from human smuggling can also be used as evidence, where it is possible to find out where the people involved in smuggling make investments. The investigative authorities thus investigate what is the top priority country for the network's main organizer where he invests his financial assets. In many cases this is not the source or the destination country, but other states such as Albania (Leman–Janssens, 2012). However, as mentioned above, the Hungarian investigative authorities are able to successfully investigate the lower layers of the network, which in many cases do not accumulate large financial assets during the smuggling process, so the asset forfeiture process is usually not typical of the investigation of human smuggling and does not provide evidence that can be used in criminal procedures.

The work of the Hungarian investigative authority is limited mainly in the case of perpetrators within our national borders and perpetrators of Hungarian citizenship, and this implies the fact that it has little impact on the arrest of the head or heads of a human smuggling network operating abroad. This has a number of consequences that hinder successful investigative work. On the one hand, these lower "legs" can quickly "regrow", so it is difficult to achieve long-term success in law enforcement. This is why the investigative authorities have an important purpose to find the widest possible exploration of organizations, but this cannot be entirely successful because of the clandestine way the criminals operate. On the other hand, as the leader of a criminal organization abroad is aware of the arrest of the members of the network, he is often informed of the criminal procedures against them, through the defendants' appointed defence counsel. By disclosure of the case files, he receives information on the investigative work and the means of evidence, and he accordingly changes the way of smuggling people in the foregoing (for example, human smugglers will avoid motorways from then on). A special case of human smugglers being informed of the investigative work is an Albanian example in which members of the personnel of the secret services of the pre- and post-transition period joined a criminal organization (Leman–Janssens, 2012).

The importance of investigative theory in knowing human smuggling

For the success and understanding of criminal action against human smuggling as an illegal organized crime activity, it is essential to know the structure and work of investigative bodies. Thus, the purpose of our study was to present the organizational and investigative methods of international and domestic police forces. This approach, however, also involves a kind of conceptual limitation, as the way in which a smuggling organization is detected and noticed determines the data that can be obtained, that is, the amount and quality of the information.

However, the acquisition of information on international human smuggling cases by the investigative authority is severely limited by the scarcity of the organization's resources compared to crime rates and the complexity and the time-consuming nature of investigative work. The successful completion of investigations is often prevented or hindered by the scarcity of human resources, such as the continuing shortage of active duty police job slots, and the scarcity of resources being further aggravated by the fact that the NBI IMD conducting the investigation usually uses its own personnel on surveillance teams or uses the personnel of the CID of the similarly overburdened border police headquarters. The cross-border nature of the crime can be considered as a further difficulty of a successful investigation, as opposed to investigative work based essentially on a nation-state structure. Various forms of international cooperation are designed to counteract this problem, but difficulties in the flow of information and the limitation of the powers of the different national agencies create additional obstacles. In addition, the personnel of the investigative authority are challenged by this race against the human smugglers, namely by the dynamics of mutual information gathering on each other's methods.

As the police are less open to making the limits of their investigative work available, researchers generally do not have access to the information on them. Consequently, however, research into human smuggling can deal only with the interpretation of the laws and the wording of the international conventions, less with the practical enforceability of legislation and the limits of law enforcement. With the present study we intend to contribute to remedying this deficit.

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The Possible Practical Model of Quality Measurement of Police Work

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Abstract

It must be accepted that every human activity is perfectible and can be improved. One of the prerequisites of development is to find aspects where there is room for development. These can be called quality indicators. The aim of the author is to outline a possible rating mechanism for police work. Mainly practical solutions will be presented, based on theoretical principles laid out by the "Good government – Good policing" workgroup of the Law Enforcement Faculty at the National University of Public Service. The evaluation system is not based on measuring the performance of the police organization, but on social influences induced by the police in public safety. Of course, because of the cooperative societal nature of public safety, the outcome of police work cannot be measured exactly, because the impacts of the other actors of society cannot be excluded. However, there is no better solution at the present, and a different interpretation would ignore the social function of the police.

Keywords: quality of police work, good policing, quality indicators of the police, legitimacy of the police, efficiency-effectiveness-quality

Premise

The nature of the police is fundamentally determined by the fact that based on its position in the state organization it is an integral part of public administration. Regarding its operation, preparatory tasks are present in it, both administrative law enforcement and criminal justice in nature. Therefore, when we are talking about measuring the quality of police operations, we need to think in a model that, in view of this diversity, is able to display the specificities of certain areas of police operations, so that the quality of the organization as a whole can be recognized. Organizational units and elements within a given police organization, not including agencies with specialized responsibilities and powers, are not able to function fully in isolation. There are a great many points of contact between criminal investigation and law enforcement areas, which cannot be overlooked. At the same time, there is no doubt

that each area has the specifics of differentiation that make it distinct from all others. Thus, a possible quality assurance model must take into account the close interaction between the fields of expertise and the specific tasks and competences of these areas and their resulting specific characteristics. The potential quality assurance model must integrate the different areas simultaneously and at the same time differentiate their specificities.

Difficulties of defintion

The concept of *quality* gains a specific interpretation for all organizations. In this paper, the quality of the police is interpreted in the framework of the *Good State and Governance Report* released in 2015. In this regard, "the state can be considered as a good thing if it serves the needs of individuals, communities and businesses in the best interest and within the framework of the common good. The state creates a legitimate and equitable balance between innumerable interests and needs, making it possible to enforce claims and provide protection for this purpose. The state has the necessary responsibility to protect and transmit inherited natural and cultural goods, and the sole interest of the latter is to be able effectively to enforce the two public goods in all circumstances, i.e. to create an effective rule of law, as part of this, institutional functioning, the respect and accountability for individual and community rights" (Kaiser, 2015: 12.). The term "protection by the state", inherent in the term, although it is primarily legal protection, cannot be construed without an effective legal application and law enforcement organizational system. This refers to the use of the term "*institutional operation and accountability"* in the definition. Therefore, proper law enforcement is one of the essential components of a good state. *In line with the notion of the good state, it is the elaboration of indicators indicating the quality of the organization's social functioning and the effects of the police and not its organizational operation and effects that can be considered a desirable goal. In this regard, quality indicators mean the factors indicating the results of the achievement of social goals and their effectiveness*. This approach differs significantly from the organizational performance assessment system.

Quality must be distinguished from the term *efficacy* and *effectiveness*. Perhaps the definition of *efficacy* is the simplest of the three concepts: it can be very simplified as a result, it is the result of a series of actions, of an activity. An activity is efficacious if it has achieved the desired result or social impact. When analyzing *efficiency*, it is worth starting from the economic fact that all resources are finite, just as the resources of law enforcement, that is, the resources available should be exploited/used in the most efficient way. Efficiency is the factor in which the individual police units are most difficult to compare. It is important to define what the aims of law enforcement are; since efficiency can only be assessed in the dimension of achieving them. Here the focus of law enforcement, the rule of law and the protection of human rights should be focussed on as a constitutionally-defined goal. Therefore, traditional market instruments are not suitable for measuring the effectiveness of the police (Tihanyi–Vári, 2015: 119.). Efficacy and efficiency necessarily raise the issue of legitimacy, as the latter expresses the social acceptance of policing as a counterweight. The legitimacy of the police means that the overwhelming majority of society, even those against whom the police take action, accepts the police's legitimate authority and their right to take the actions that they do, even if not everyone agrees with them or some dispute

certain policing actions. The legitimacy of the police therefore means that their operation is not merely legitimate but widely accepted. The social acceptance of the police is fundamentally determined by how they define their own purpose, their role and thus their relation to society. In other words: "The police's service character or its power-based bias, that is, its authoritarian or performance-based operation, can be assessed in a reassuring way by their emphasis on their goals and the priorities of their purpose, between the "police state" or the "community approach" (Vári, 2016: 496.).

The legitimacy of a police operation is closely related to the *principle of necessity* laid down in the Police Act. The principle of necessity can be traced back to the Constitutional Court's legal test of the restriction of fundamental rights. According to this, a fundamental right can be restricted if it is necessary to ensure another constitutional right or constitutional fundamental interest. In this case, a fundamental right may only be limited to the extent to which it is absolutely necessary to ensure that the competing fundamental right or fundamental interest is ensured. No restriction of fundamental rights can lead to the emptying of the given fundamental right. As an axiom, it can be stated that, apart from the request for information, there is no police measure that would not restrict a fundamental right. Because of the restrictive nature of police actions, they can only be applied if it is necessary to ensure another fundamental right or constitutional interest. Given that public safety is a constitutional interest enshrined in the Fundamental Law, the *de jure* law-restricting nature of police actions is naturally constitutionally acceptable. The *de facto* functioning of the police will then be constitutionally acceptable if it meets the criteria of the Fundamental Rights Restriction Test in its action, i.e. they only take a restrictive action if it serves the purpose of safeguarding or restoring public safety. Only the action fulfilling the above requirement can be accepted. That is, it is not enough if police action formally complies with the legal regulations, it is also necessary to substantially serve the purpose mentioned above. *Maintaining the principle of necessity gives the social legitimacy of the policing operations*. This presupposes that the police actually intervene in social situations only in an emergency situation. State interference with the individual's relations systems is acceptable to society when it comes from a social interest. Against the law-restrictive state intervention, an even higher standard can be set, which can be justified by a social emergency. Accordingly, the social legitimacy of law enforcement is given if the law enforcement agency addresses social emergencies. Such a social emergency is a violation of public safety because it is a violation of the basic norms of social coexistence (Tihanyi, 2013: 10–11.). In this way, legitimacy is already a quality indicator, which cannot be measured other than by interviewing society.

After this delimitation, it is possible to posit which dimension measurement is required for the quality of the police operation. The achievement of the goals of the organization itself can be measured. This undoubtedly expresses a kind of quality, namely the quality of achieving organizational performance goals. If we adopted this approach as the basis for quality measurement, it would result in the police being taken out of the social medium that they are intended to protect. This cannot have any real quality measurement. Instead, we focus on the social changes in the forefront of our investigations, which are caused by the operation of the police in public safety. To this end, it must be added that the public safety is a cooperative product in which the state's public services and the individual and collective performance of self-defence are summed up (Finszter, 2009: 181). At the same

time, it is undeniable that the police are the main guardian of the state of public security. This is particularly true in the light of the fact that the community in this country expects the police to ensure public safety and hold them accountable for it. (Barabás et al., 2008).

Due to the aforementioned co-operative nature, the social quality of the operation of the police cannot be measured in a pure form based on the state of public safety, because the effects of other actors in society cannot be neutralized. A better solution, however, is not currently available because other ways would lead to ignoring the social mission of the police. The police are not a safety-producing plant, but a law enforcement agency and authority, therefore the threefold requirement of legality, professionalism and service-like operation is decisive in their performance, and their effectiveness cannot be estimated with statistical data. In this case, it is not about quantity, but quality, the quality of the rule of law. In constitutional democracies, law enforcement must strike a balance between legitimacy and effectiveness. Values of the rule of law cannot be protected by violation of the law (FinszteR, 2009: 179.). Public safety is a measurable social phenomenon, the objective status of safety of life, limb and property is reflected in crime statistics, and public opinion on public safety reflects subjective safety.

The basic features of the quality measurement model

Within the framework of the social function of the police, it is necessary to define the areas whose quality is to be measured. Here and now I want to deal with the problem of the quality of the police tasks that can be distinguished from other branches of civil administration. That is why I will not go into the tasks that the police typically perform with civilian public administration. Thus, I have to overcome all the administrative areas that traditionally fall within the framework of the administration. This is not to say that there is no place for quality measurement or that those performing the tasks should not deserve the highest possible level of recognition. The only reason for this failure is that this area is no different from civil administration, so well-designed administrative measuring instruments are already available for quality measurement. It is necessary to develop a model that takes into account the peculiar features of the different special areas of the police profession and is capable of expressing the quality of the operation of the police integrating them in a unified organizational structure. The solution to this is the need to determine the impact areas of police operations.

Rogge and Verschelde (2012) can fundamentally determine 6 police functions on the basis of which the local community judges the work of the police:

1. *Community work*. This can be identified with a service performed within a community, which includes getting to know local problems and providing the population with information. Community work is typical of the activities of local police units. It only appears in the set of tasks of the regional police units or police units with a regional legal status incidentally and consequentially.[1] Since local police forces are the basic units of the police, this impact area is unavoidable.

[1] Rapid Response Police Unit (hereinafter: RRPU) also conducts police operations in public areas at the local level. However, this cannot be identified with community work because RRPU works as a police unit with

2. *Availability to the public*. In fact, emergency call and requests for assistance as well as response time.
3. *Intervention*. Managing crises, masses, events. Under domestic conditions, this function is actually identified with the activity of the police support units, which has the specificity of being organized around a single well-defined task.
4. *Victim Protection*. This impact area covers the avoidance of secondary victimization and victim support.
5. *Local Investigations*. It is natural that in the case of investigating authorities with regional and national competences, the impact area means the investigations conducted within their own scope of authority.
6. *Maintaining public order*. This can be identified with the police's function of guarding and protecting law and order.

After designating the impact areas, the identification of the indicator groups that are the basic elements of the quality assessment. Feedback from and satisfaction of the local community can serve as an indicator of community work. Meaningful information on the quality of prevention and communication with the community is only available from the users of the service, i.e. from the different groups of the community. Therefore, following the objectives of the good law enforcement report, it is necessary to measure the satisfaction of the public (Sallai et al., 2016). The primary indicator for availability to the population is the response time. i.e. the time between receiving a call and the commencement of the police action. In the case of a particular case, members of the public do not evaluate the activities of the operational control centres, but they expect quick and effective solution to their problem, which necessarily includes the operation of the call centres receiving and forwarding calls from the public. There are several indicators available for availability to the public. Such is the day-to-day contact with the police, the customer reception of local police units or the quality of official consulting hours. The significance of all these is not to be underestimated, but in terms of volume it is far behind the complaints/reports.

In the area of intervention, quality indicators can be defined in a separate way because, unlike other police functions, the use of the police support unit at troop level has a separate, distinct purpose. This goal can be defined as the security of a given event. We accept this as a sort of social event organized by humans, whose order is maintained through the use of police support units at troop level. The complexity of the troop level activity is characterized not only by the service performed during the event, but also by the fact that we have to evaluate the preparation, training, the level of the conciliation negotiations, the level of cooperation with the organizers, the directors, the collection of information, establishing the chain of command for the event, logistics and other organizational tasks. The purpose of these is to assure the security of the event. Accordingly, the only tangible indicator in this area is the number of police actions taken against forms of conduct violating the security of the event. The fewer acts violate the security of the event, the higher the security level. Absolute security is never possible, it can at best be striven after. If we depart from the axiom of the obligation to take action, we can reassure ourselves that the police will

national jurisdiction, it is not linked to any particular village or town/city. Their operations in public areas are of an occasional, periodic or recurrent nature, but they are far from being continuos, and their liaison with the populace is of low intensity.

take action against forms of conduct that violate security. Therefore, the fewer these police actions are, the higher the level of the security of the event. When designing the indicator, account should be taken of the volume of the event. Most of all, the number of participants/attendees seems to be suitable.

The only indication in the area of victim protection is the feedback of the victims and their opinion on the police action. This can be perceived as a kind of customer satisfaction. In the case of victim protection, we need to give the victim's criminological concept a broader understanding and an indicator based on measuring the satisfaction of every person filing a denouncement or making a report to the police can be accepted as an indicator.

The effectiveness of the investigative work is not the same as the proportion of reported criminal offenses being submitted to the prosecution service for indictment, but it could be more likely be measured by the efficiency of indictment. At the same time, we would also assess the efficiency of the prosecution service and, on the other hand, statistical analysis would be impossible. That is why we must make do with using the traditional indicator of efficiency of investigation. This indicator cannot be identified with the detection indicator for cases of unknown perpetrators. It would be a very clean situation to use this indicator. It should be emphasized here that effective investigations are not just cases concluded with indictment. Investigations closed due to the absence of criminal offence or due to grounds for exclusion or termination of criminal charges are also included in the indicator of the efficiency of investigations. The outcomes of the investigative work are influenced by a number of factors. Typically, the staffing level, capacity and motivation of police forces. Since the level of morale and qualification, which cannot be identified with the level of educational qualifications acquired, is difficult to measure, we must therefore make do with the staffing level of a given police force as a correction factor. In order to avoid distortions caused by internal organization work, a correction factor should be used in which the number of staff appear as labour force capacity. An important factor for this is the number of cases per investigator. It is a natural phenomenon that there are both cases that are easy to clear up and cases that are extremely difficult to clear up. That is why the number of cases simply does not say anything. By contrast, the number of hours worked on a particular case type already expresses the workload. The shortness of the investigation time cannot be absolutized, that is to say, we cannot say that the investigation of the shortest time is the highest quality because it would lead to the time factor going to the detriment of effectiveness. Therefore, the ratio established in the context of effectiveness and time factor can be conceived as an appropriate indicator.

In order to determine the quality of maintaining law and order, neither the number of offenses nor the number of police officers nor of the police actions are sufficient. But even the number of hours spent on duty in public areas will not serve as any quality indicator. These are at most quantitative indicators alone, but they are not suitable for demonstrating what quality police work they characterize or result in. Therefore, as an indicator, this function may serve as an indicator of the degree of change brought about by police actions against a given type of conduct violating law and order, and of the volume of police action taken against what volume of criminal conduct. This function needs to be understood sufficiently broadly and the quality of police work aimed at maintaining public order, transport, and finally orderliness of cross-border traffic should be examined here. In the context of the public safety service branch, in the area of police action, this raises the need for two

indicators. On the one hand, the proportion of certain types of registered offenses and of the perpetrators caught in the act, and the proportion of arrest warrants and of the persons on the wanted list arrested. It is in the nature of the phenomenon under examination that in areas where there is a higher crime rate, more crimes come to the knowledge of the authorities, so it stands to reason to expect more arrests. The same logic will apply to the number of arrests made on the basis of an arrest warrant or the wanted list. The proportion of arrest warrants issued by the various authorities and the arrests made demonstrates the quality of work related to issuing warrants of caption. In the area of traffic police, the violations of the traffic rules and the accidents resulting therefrom should be turned into indicators, so as to form an appropriate ratio between the causes of road accidents and the police actions taken against them. In the area of border protection, it is to be accepted that the migration pressure cannot be influenced by the police, but they can handle the resulting problems. The effectiveness of this work should therefore be assessed in the light of migration pressures.

An established, but very simplifying solution for measuring the function of maintaining public order is the ratio of different misdemeanours, criminal violations, or delicts per 100,000 of the population. This area also includes the effectiveness of police actions, manifesting itself in police actions whose examination is limited to the trend in the number of actions taken. In this respect, the proper ratio should be the number of legal violations targeted by police actions and not police staffing levels. With this solution it is also possible to measure not only quality but also the available manpower in relation to the volume of criminality in a given area. The number of offenses and misdemeanours should continue to be used as an indicator but should be considered in the light of appropriate proportions. Similar to community work, the evaluation of police work related to maintaining public order locally is also significant in terms of customer satisfaction. However, in this case, the concept of the customer does not coincide with the notion used in public administration or with the concept of customer in the sense above but encompasses a much broader personal scope. In this regard, everyone benefiting from the achievements of police's role of vigilance, protection and maintaining law and order. This can ultimately be identified with society as a whole. Measuring social satisfaction is crucial. This indicator is not of a professional nature, but of a more political nature. Society passes judgment not from a professional point of view but based on its subjective impression.

It must be accepted that countless factors affect the objective indicators based on the number of crimes and misdemeanours, of which only one is the work of the police. It must also be accepted that the police cannot influence the evolution of any type of crime. It is therefore necessary to identify the offense that can be used as an indicator of the work of the police. Among the factors independent of the police can be mentioned the number of inhabitants, the demographic characteristics (e.g. age and gender) of the population, the economic characteristics of the area (e.g. unemployment rate, GDP), infrastructure of the area (e.g. road network, settlement structure) (Mátyás, 2012: 41–49.). All of these cannot be used as a correction factor to be taken into account in the calculation of the indicators. Too many components and the use of countless factors that would affect them would not allow for qualifying the operation of the police units which could be utilized in practice. It is therefore necessary to select the most typical, most potent and most applicable factors that affect the criminality of a given area and should therefore be taken into account in the assessment of the crime rate.

In order to measure the socially useful quality, it is appropriate to take into consideration three aspects:

1. To establish ratios that can express the impact of the police on the state of public safety.
2. This also means that there is a need for indicators that include indices of local social inequality.
3. It is inevitable to measure customer satisfaction and the satisfaction of the public.

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Good State – Good Police: Focus on Efficiency (Conceptual Frameworks, International Outlook)

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Abstract

The results of modern scientific research now play a more important role than the quantitative indicators produced mainly during police work, and most indicators of quality – e.g. "public satisfaction" or trust in the police have become scientifically more and more acceptable. From the 1990s besides the "utilatirist" efficiency narratives there is a need for "procedural truth" and the inclusion of social equality elements. In addition, no valid data can be obtained without taking into account local sociocultural and criminological characteristics. In order to ensure effective operation and sustainable development, it is necessary to develop and continuously operate a measurement and evaluation system which – focusing on specific areas – provides us with feedback on the content and changes of police. The Faculty of Law Enforcement at The National University of Public Service considers it as a major and an important task of its institutes, departments, research centres and future doctoral school to contribute towards the development of the modern police's operational framework which is based on an interdisciplinary approach and an objective research-based knowledge. The efficiency of the police – as one of the biggest governmental organizations – is closely linked to the concept of good state. The current Hungarian regulation on the questions of the efficiency of the police does not have a developed methodology or it is out-of-date due to its statistical approach. Taking all these into account, the scientific development of police efficiency cannot be avoided, and the revision of its criteria based on international trends is timely. This study besides providing an overview of the relevant definitions also gives a short overview of the international scientific literature on the measurement of police performance.

Keywords: performance measuring, efficiency, good state, indicators, police, crime geography

The social dimension of the "efficiency" of the police

In essence "efficiency orthodoxy" is the rational and practical use of resources and costs in order to produce the required product or service. Its axiom is that every production branch, process and service must be rationalized, while expenditure is minimized and profit maximized in order to achieve this. The question is whether the police as security provider exploits all the opportunities which determine its organization and operation socially and politically (i.e. uses the conditions optimally, that is rationalizes) in its own social medium (among its service users) in order to increase satisfaction and trust (or profit) (Vári, 2016: 582.). When setting out the interpretative framework for good police, defining the aims of police activity is important as efficiency can only be assessed in the dimension of achieving these targets. These constitutionally defined aims are as follows: compliance with the law, ensuring the rule of law and protecting human rights. For this reason, traditional market tools are unsuitable for measuring the quality and efficiency of the police. In order to consider measuring efficiency at all, devising indicators which demonstrate the protective capabilities of the police in a way that is consistent with the social objectives of law enforcement is necessary. Therefore, instead of the organizational aims of the police, its social objectives have been the focus of this research. The organizational aims can be regarded as the quality indicators of internal efficiency. Compliance with the performance expectations set by the organization (within the framework of bureaucracy), however, can *easily* contradict interpretations of effectiveness set by other areas of justice and mainly by society (Vári, 2015). Thus, in line with the concept of the good state, devising indicators that show the quality of the social (and not organizational) functioning and impacts of the police is decisive. "The police will not receive an objective picture of the development of its social role while it assesses its own performance using a standard it sets itself." (Tihanyi, 2013: 8.). In this regard, quality indicators mean factors indicating the results and effectiveness of the implementation of the social objectives.

Conceptual premises

The quality characteristics of police work appear in the performance assessment system of police forces. The indicators in this system are both quantitative and qualitative. Quantitative indicators include the number of police actions and indicators characterizing crime. These cannot be regarded as actual indicators of quality due to the absence of the benchmark necessary for this. Different local characteristics require different organizational, staffing and technical conditions to enable police forces working in different geographical areas to deliver service of at least approximately the same standard. For this reason, converting the indicators of organizational performance assessment into qualitative indicators or replacing them accordingly is treated as a key criterion. Quality indicators are suitable to show the input values that need to be changed in order to shift the output values in a positive direction.

According to relevant literature, it seems evident that the definitions of public order and public safety as the basic interpretative framework of police functions are fairly unclear (Finszter, 2014a: 160.). Of the existing and familiar definitions, the interpretation of public safety in Team Consult's 1991 report fits in with the qualitative indicators in the Good State – Good Police project. This states that public safety means the part of the intangible

infrastructure of modern society which enables individuals and communities to achieve their goals that are valuable for society (Team Consult, 1991). Accordingly, safety, like other forms of infrastructure, is an investment-intensive area. How the finite economic room for manoeuvre is exploited is the responsibility of the current government. Police tools which are able to produce results that can be measured objectively and sustained in the long term, and which positively influence the subjective sense of security of the population need to be applied (Tihanyi, 2015: 160.). In this approach public safety means the medium in which individuals have the right to freely develop their personality in a way which is in the interests of society. Géza Finszter differentiates between two interpretations of the concept of public safety based on normative and tangible approaches. In the normative definition his starting point is that creating public safety is, as a regulatory subject of constitutional law, a state objective, whose implementation is primarily the responsibility of the government. To this he adds the state obligation arising from the constitutional right of freedom and personal safety. This means that the state must ensure security for its citizens by means of public administration. Thus the normative concept of public safety is in part a state objective, an interpretation corresponding with effective constitutional legislation. Its implementation is the responsibility of the executive. The tangible notion of public safety, on the other hand, is identical with the public safety that exists at an everyday level and can be experienced or whose absence causes adversity.

The police is not a factory producing security but an entity and authority overseeing legal order, thus in its performance the triple requirements of legitimacy, professionalism and service are dominant. However, the degree to which these requirements are met cannot be estimated through statistical data. In this case, quality – the quality of the rule of law – and not quantity is considered. In constitutional democracies, law enforcement must find a balance between legitimacy and effectiveness. The values of the rule of law cannot be protected by defying the law (Finszter, 2009: 179.). Public safety is a measurable social phenomenon: the objective state of the security of persons and property is reflected by criminal statistics, while public opinion of public safety reflects a subjective sense of security. Undeniably, the main custodian of public safety is the police. This statement is particularly true in the light of the fact that domestic society expects the police to create public safety and holds the police accountable for it (Barabás et al., 2008). If public safety is the output of the system, its quality can be evaluated in every aspect of reality in the light of both effectiveness and efficiency.

Thus public safety constitutes an output result of the police both in terms of the public image of it and the general and collective feeling about it. The efficiency of criminal statistics, and thus of the entire police organization, becomes interpretable in this regard. Naturally, due to its cooperative nature, the state of public safety is influenced by numerous factors apart from the work of the police. Thus it is impossible to draw up a clinical formula about the quality of police work based solely on data characterizing public safety. However, despite all these deficiencies and flaws, no better approach is available. When the state of public safety is seen as the work of the police, essentially a negative approach is applied since the police influences the result or product from which its own performance originates in many cases but, apart from these, a number of (crime geography) factors are also involved which are independent of the police and in whose development the police plays no, or only a very small, recognized role.

Measuring police performance: an international outlook

Measuring police performance has grown into an increasingly important research area in many countries. However, there is no academic consensus regarding the form or method applied during measuring efficiency. Furthermore, which of the various indicators should be used in order to promote better performance is likewise contested. However, there is full agreement that measuring efficiency is potentially an excellent political and professional tool, and may have a significant impact on the work of the police and its perception. International literature on this published from the 1970s onwards can be categorized based on a number of methodological aspects, mainly dependent on whether the researchers give priority to quantitative or qualitative, and objective or subjective factors. Measuring efficiency is, nevertheless, a rather sensitive issue as, due to a flawed concept or law enforcement philosophy, police organizations may easily fall into the trap of placing the emphasis on simply and routinely collected administrative indicators whereas these may be insufficient and have less contextual value. Thus the most important starting point for research is to correctly define performance indicators. A negative side effect can be distorting statistics in order to achieve the performance targets and requirements. As regards the choice of indicators, international research results have identified an interesting paradox: the more favourable an indicator is the less accessible it is, and often it can only be produced expensively. Simple indicators that can be produced cheaply from routinely collected administrative data – such as indicators of crime, the effectiveness of investigation or crime clear-up as well as response times – are typically less informative as regards the actual performance and tend to have negative side effects. More informative indicators – such as satisfaction with the police, fair processes (treatment by the police) and the latency of some crime categories – are much harder and more costly to identify and often require surveys specifically designed for the purpose.

Collier (2001) starts from the hypothesis that human rights and legal procedures in general may be harmed by the endeavours of the police to meet performance measurement goals. He draws the conclusion that greater autonomy should be granted at a local level and a model based on qualitative indicators would be more favourable. Feilzer (2009) warns of the dangers of relying on the *British Crime Survey (BCS)*, which is used in the United Kingdom and essentially applies quantitative sources, as part of police performance measurement. She primarily focuses on methodological issues and, in particular, on the lack of validity and reliability of the measurement questions. The document examines the use made of BCS data in the performance measurement of local police forces. The research attempted to address the concerns expressed by members of the North Wales Police regarding the validity and reliability of the data in this method of measuring efficiency.

Several models have been proposed as alternative ways of measuring police efficiency. One is the processing method of *Data Envelopment Analysis* (DEA), which allows "objective" input and output measures to be taken as a basis. The most effective comparison of this type was conducted by Drake and Simper (Drake–Simper, 2005), contrasting 43 police forces from the aspect of the geography of crime using DEA. This allowed the examination of the impacts of environmental factors from the viewpoint of the effectiveness and efficiency of measures. The authors found that environmental factors had a substantial impact on the relative performance rankings of the police forces. For instance, the performance ranking of the North Wales Police changed when factors such as average population, the

number of single-parent households and the sparseness of the population were also considered, moving up from 30th to 1st place.

According to Moore and Braga (2004), reducing crime in the community's interests cannot be achieved by increasing the number of arrests, detentions and arraignments. The authors believe that there are many other factors that can have a substantial influence on reducing crime by exercising a greater impact on society. Charbonneau and Riccucci (2008) outline the importance of the factors of social equality in measuring police performance, suggesting indicators of this nature, including the evaluation of fair treatment, which is similar to the definition of procedural justice. In relation to trust placed in the police, one piece of research has confirmed that public confidence in the police is primarily dependent on demographic, attitudinal and contextual factors. The authors (Jang et al., 2010) point out that a number of predictive aspects show the development of confidence. Such are the homicide rate and the legitimacy and social mainstreaming of democratic values. In countries where the homicide rate is high, confidence in the police tends to be low. Analyzing the institutions of democracy, it was found that public confidence is positively linked to these. Significant predictors were also found based on individual variables, such as age and education. A positive relationship was found between conservative values, personal satisfaction and confidence in the police. In line with the attitudinal and social contextual predictors, in general lower confidence in the police could be expected in deviant subcultures.

Rogge and Verschelde (2009) conducted comprehensive, empirical research using complex indicators and a non-parametric mathematical method in order to measure citizen satisfaction with local police services and in relation to regions. More precisely, the authors of the study proposed an approach using the previously mentioned, popular DEA approach by applying the *Benefit-of-the-Doubt* model. The chief advantage of this approach is that it weights the impacts of the functions and tasks performed by the local police in citizen satisfaction using an endogenous method with composite scores, thereby enabling the numerical calculation of the different values and approaches for a fuller interpretation of "good local policing" among police services. The methodology provides a good illustration of citizen satisfaction data also in the broader assessment of the local police and the regions. The DEA model, using a non-parametric assessment methodology, highlights the strong and weak points of police functions determining citizen satisfaction and the development of the performance values both at a micro (local police) and macro level (region). The researchers found that the average macro satisfaction score was 91.94% in Belgium. This clearly indicates that most Belgian citizens are generally satisfied with the work of the local police services. Nevertheless, the remarkable advantage of the model is that it was able to identify the basic functions of the local police that were considered to be the most important by the public, pinpointing the indicators which essentially explain the weakening or strengthening of citizen satisfaction in relation to practising the various police functions. The results have shown that an urban environment in itself does not strengthen the level of satisfaction regarding the participating local police service, and that regional differences have a much greater significance than originally thought. This was the first piece of research to measure citizen satisfaction with multidimensional scores and then to use the results in the evaluation of the efficiency of the local police forces. The research employed a method that took account of the individual circumstances of the local police forces by weighting them in an endogenous manner and assigning independent values to them.

Timothy Shilston, Chief Superintendent of Northumbria Police in the United Kingdom, introduced the *Black Box* method as a qualitative-based assessment. In his model, he used the terminology and methodology of air crash investigation. The study (Shilston, 2011) finds that this method would enable the police to examine events chronologically, in other words looking at the whole of the process of generating statistical data. Through the conscious assessment of qualitative indicators in order to measure its own activity, the police's role in the development of output statistical data could be detected throughout the process, from reporting to the solution, i.e. the outcome. The author reaches the conclusion that the quantitative measurements of police performance were flawed, and they needed to be replaced or at least supplemented by qualitative methods. He devised a process which analyzes the start of the performance and aids development both at the level of the individual and the organization. The method offers tools which can be applied in order to put reforms into practice and to provide a better standard of service as well as to increase public confidence in the police. The main workload of the process is registering data and keeping detailed records of them. Most police organizations in the United Kingdom and elsewhere in the world have at their disposal a similarly detailed and full information database of all incidents reported and the measures taken. This database offers a rich source for the team responsible to gain information in order to make a major advance towards offering higher standard services. Regrettably, as the author admits, this opportunity almost always remains unexploited. In June 2009 Northumbria Police came 8th among the 43 police forces in England and Wales as regards public confidence, and 48.8% of those questioned expressed their confidence in policing. The same survey conducted exactly 1 year later placed the same organization in 1st place. At that time the police organization achieved a confidence index of 58.8%. The Black Box research revealed that in order to ensure the optimal operation and performance of the functions of the police, instead of police chiefs devising the best solutions and most practical reforms, the requirements of the users of the police services should be taken into consideration (Shilston, 2011).

Performance measurement in practice: police in England and Wales

The efficiency measurement method embracing the trio of effectiveness, efficiency and legitimacy at present only works in England and Wales. The indicators measuring police performance are freely available to the public, allowing access to all the data to anyone through an online link. This fully ensures the principle of transparency, which is the main source of citizen confidence required for the functioning of the police. The measurement system relies on three pillars. The first is the range of data embodying effectiveness, which is comprised of mainly quantitative statistical data generated in connection with the operation of the police. These values are mostly per head of population, but strictly speaking per police force, and, in addition to generated data, also cover service-centred crime prevention activity. The second pillar is financial efficiency, i.e. how much these police services cost the public or how efficient a police force is in terms of costs. The third pillar is legitimacy, which covers public trust and satisfaction as well as their source, which is social equality. Based on a comparison of these three, the performance of a given police force can be assessed on a four-grade scale.

In this model the key area is supporting police work and increasing motivation in performance. Involving officers in decision-making processes where their concerns will be addressed while transparently showing the process of how their superiors reach a decision undoubtedly has a positive impact on their own performance of work in a fair and correct manner (College of Policing, 2015: 11.). According to research, *organizational justice* embraces a broader range in performance measurement than simply internal procedural justice, and includes distributive justice, i.e. the perception of how fair the allocation of resources, labour force and financial and intellectual rewards is within the organization. *Procedural justice* covers employees being informed of decisions, internal information flow, the system of career progression, and the respectful and dignified handling of employees by superiors. Of these two types of justice, research tends to show the impact of internal procedural justice to be more significant as regards attitude towards the environment (Greenberg, 2011). An Oxford research project conducted at Durham Constabulary provided a convincing argument that organizational justice, which incorporates the aforementioned procedural justice exercised by managers and senior managers (inclusion in decision-making, providing information, treatment) and distributive justice, has a positive effect on organizational cohesion, resulting in more social and cooperative attitudes and forms of behaviour, which will then diffuse to the work culture of employees (Bradford–Quinton, 2014). Another piece of research (Bradford et al., 2013) also revealed a statistically significant connection between organizational justice and employees identifying with the organization at the police, which also affected performance. The following findings were made:

- Officers who recognized that the organization was fair towards them were more likely to identify with the organization's aims.
- Unfairness showed a consistent connection with the development of a cynical and authoritarian subculture among officers.
- Officers who felt that they are enjoying the support of the public trusted their organization more.
- Officers who trusted their organization more supported procedural guarantees, legal processes and the application of proportional force more.

Unfairness and the absence of organizational justice in the police presents a major organizational risk. Research results indicate that the feeling of injustice in an employee is likely to lead to less inclination to provide quality service to the public. Such employees will gradually become cynical and less committed to the goals of ethical law enforcement. As regards decisions in their area of competence, there is a tendency to have their discretionary powers curtailed, which becomes apparent in police operations by avoiding legal measures, operating a selective mechanism for incidents, and strengthening procedural passivity, which can result in prolonging cases. Thus ethical, legitimate police operation is in a close context with organizational culture and the enforcement of internal procedural justice. This is known as a feedback loop. In other words, procedural justice within an organization carries greater public support but this may also appear in a negative aspect which affects the organization's performance. Bearing precisely these research results in mind, every year surveys targeting police legitimacy are conducted as part of efficiency measurement in English and Welsh police forces. By way of example, in 2015–16 this took place at 16 police forces.

Findings

In the light of international research and its application in practice, due care must be taken in the area of the development and reform of measuring police performance. When applying certain methods and technologies in practice, the best solution seems to be to measure performance using a variety of processes. It is advisable for the professional leadership to publish results in order to provide information aiding guidance rather than using them centrally and uniformly in the form of "strict" figures as organizational or performance requirements. Through this process, the benefits of each methodology can be extracted while minimizing the risk of negative side effects. This is particularly true of a series of traditional indicators (such as indicators of crime clear-up, investigation effectiveness, clarification or response times) which ideally can function as indirect and practical performance indicators when examining the efficiency of police activities.

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Lídia Balogh

Supposed Ways of Allusion to Ethnicity and Social Status in the Crime News Released by the Police

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Abstract

The aim of the study was to investigate whether the news released by the Hungarian Police (and published on its official website, Police.hu) include any information – either explicit or allusive on the ethnicity (first of all: Roma ethnicity) of those in the stories. According to the results of the study, based on the method of content analysis, e.g. the term "Roma" is almost never used in crime news. However, the phrasing of news may convey messages to the audience, through the application of certain linguistic clichés, regarding the (Roma) ethnicity of the (low) socio-economic status of those mentioned in the crime stories. This communication practice is obviously worrisome from the aspect of social inclusion. Moreover, it should be mentioned that another type of police news, reporting on crime prevention initiatives, quite often includes references to Roma national self-governments as partner organizations of the Police. In the cases of these news, it is not the phrasing itself that gives rise to concerns but the phenomenon of "securitization", reflected in the concept of these joint initiatives; i.e. minority self-governments are originally mandated to represent the collective interest of a minority group (first of all in the field of language and cultural rights), thus the question is why these kind of organizations participate (and what kind of roles they play) in crime prevention projects.

Keywords: Hungary, police, communication, minority groups, ethnicity, socio-economic status, securitization, content analysis

Introduction

The research presented below concerns the *social* aspect of security, as certain social issues may be covered in political discussions as security issues due to the low efficiency of the efforts towards social inclusion and the ethnic framework attached to social tensions, to the detriment of the human rights approach. Political philosopher Will Kymlicka considers the

avoidance and reduction of "securitization"[1] as one of the most important pre-requisites of democratic operation in multi-cultural societies besides the human rights consensus in the relationship between minorities and the state (Kymlicka, 2010: 43–44.). The media may play an important role in building social stability, easing the cohabitation of different ethnic groups and promoting the social integration of minority groups through equitable media representation of minorities but, as Teun Van Dijk also pointed out in his book published on the turn of Millennium examining the correlation between "new racism" and news media, a considerable part of the "white" (i.e. majority) public may feel counter-interested in improving the media image of minorities (Van Dijk, 2000: 37.). With regard to Hungary, the Roma minority and the political and public political approaches, as well as social attitudes to the Roma minority may be mentioned in relation to securitization and negative media representation.

The importance of police communication

The research aimed at examining whether information of ethnicity (primarily Roma ethnicity) appears allusively in the Hungarian news media primarily in relation to crimes and thereby how can the media convey hidden messages to the audience in relation to the presented stories. The case study looks into the practice followed by the Hungarian Police on its online news platform *Police.hu* and examines a (quasi) medium for which objectivity and neutrality are requirements based on the principle that the police must serve the members of society without any discrimination based on ethnic or other grounds. The monopoly position only enhances the responsibility of the authors of police communication: in relation to certain topics or cases the police news represent the exclusive and primary source of information. Concerning the internal norms of the Hungarian police, it is worth mentioning that the National Police Order issued in 2013 on the rules of information that may be supplied to media content providers defines the principles to be applied by the police communication bodies, i.e. the National Police Communication Service and communication officers of police headquarters not seated in Budapest as follows: "The basic requirements for communication bodies and the communication activities pursued by them are as follows: a) fast response, b) authenticity, c) uniformity, d) consistency, e) clarity and f) impartiality" (ORFK, 2013: Section 24).

What makes *Police.hu* especially important is that, as already shown by other research and analyses, many Hungarian journalists and editors look at police communication as a source of news without criticism. The research report published by Mónika Füstös in 2012, assessing police communication in relation to the illustration of the problems of prostitution not only pointed out that *Police.hu* is an outstanding source of information for the media, but also made a proposal that the police news should reflect complex problems of society with a great deal of sensitivity and attention (Füstös, 2012). The analyses published by Független Médiaközpont (Independent Media Centre) in 2014 examining the presentation of

[1] It also needs to be noted that the English term *securitizationization* is also used in finance, although it refers to a different notion there. In this latter case, the Hungarian equivalent of *securitization* is "értékpapírosítás" (securitizationization).

female and male roles in media also concluded that the mechanical adoption of police news was a phenomenon that existed widely in the Hungarian media (Független Médiaközpont, 2014: 42). Similar conclusions were reached in 2015 by Gábor Bernáth and Vera Messing, studying the *Police.hu* articles in relation to the news covering refugees and migrants: while in this area the police news represent one of the most important sources of information, at the same time the police media is also "one of the main sources of vague categories" (Bernáth–Messing, 2015: 12.).

Framework of the case study

The case study is based on the content analysis method (Kohlbacher, 2006). The modern content analysis combines the qualitative and quantitative approaches; according to Klaus Krippendorf "[a] content analysis is a research technique with the help of which repeatable and valid conclusions may be drawn from data about their context" (Krippendorf, 1995: 22.) – "context" refers to both a verbal narrative context and situation (social, political or cultural environment) (Krippendorf, 1995: 32–33.).

The concept of the research relies to a great extent on the conclusion of the research report published by Gábor Bernáth and Vera Messing in 2012 under the title of *Push the side*, according to which the use of the expression *kinship* ("rokonság" in Hungarian) in the Hungarian media, either as a consciously or unconsciously applied instrument may be used for or allow the identification of the actors of a story as Roma by the public (Bernáth–Messing, 2012: 50.). To the question of why this expression may be suitable as an instrument of suggestion, there are a number of responses. We can rely in good faith on the ethnography and cultural anthropology literature, which pays outstanding attention to the traditional role of the group of kinship in relation to the Hungarian Roma communities (Szuhay, 1999). It may, therefore, be assumed that the association of the importance of the relationships of kinship with the Roma ethnicity is part of the publice awareness. According to a more suspicious assumption, there may be social psychological factors behind the association: the perception based on racial categories and essentialization of "difference" (i.e. that "they have the same blood in their veins", also "make them" biologically different "from us"). Beyond the conclusion of the Bernáth–Messing study referred to above, this statement was also another key point while this case study was being planned, according to which "occasionally the police also actively forms the media image" (Bernáth–Messing, 2012: 16.).

The research question was whether this phenomenon, i.e. the suggestion of the Roma ethnicity of the actors, may be observed drawing on the reference to their relationships as "kinsman" and if so in what manner and to what extent in the official news website of the police. What makes this issue relevant is partly the fact that Police.hu is considered a major source not only by various media, but often news are taken from there without any modification (Balogh–Füstös, 2015). On the other hand, the examination of Police.hu seems obvious because this platform presents crime news in concentration which, in light of persistent presence of "Roma criminality" in the public thinking as a concept for the reasons of a crime (Bársony, 2013), presumably constitute a hotbed of the phenomenon intended to be observed. To further illustrate why police communication is important in terms of the media representation of the Roma and in general why the assessment of the police approach

may and has always been important in terms of the social position of the Roma, we should quote a remark by cultural anthropologist Patrick Williams: "The police archives are the richest source for historians studying the Roma […] society has always and is still sending out police forces when they notice any Roma anywhere" (Williams, 2010: 265.).

The hypothesis consists of two parts:

1. Sometimes the news also refer to the kinship of the actors when that background information is not required for understanding the story, when there is no need to know that certain actors are relatives or that certain actors have relatives unless the additional information is specifically aimed at conveying the message complex that those actors are Roma, (i.e., according to the allusive message ethnicity and their involvement in crimes are essentially related in their case).

2. Sometimes the expressions of *kinship* may also have an allusive effect when reference to the relationship of the actors is justified in terms of the story but the author of the article would use a different synonym if the actors were not Roma. It should be noted that given the nature of the problem there are certain epistemology limits that restrict the potential proof. To confirm an assumption one should know which news are about Roma and which are not, but this is exactly what the readers can theoretically not be aware of and this is the aspect that could be understood only from various (assumed) suggesting factors.

The relevant news were identified, i.e., the sample was built by using the search engine of the Police.hu website by specifying a search period and search expressions. The analysis focused on the news published between 1 June 2013 and 31 December 2014 (19 months). In total five expressions were used as search words in relation to the hypothesis, with the following order in terms of the strength of the hypothesis and the assumed suggestive effect: the strongest is *kinship,* followed by *kinsman,* and *family member,* and the weakest (assumed as neutral) was the *relative.* The term of *head of family* can also have a suggestive role, although it does not fit the group for conceptual reasons. Only news related to criminal and police actions were included in the pattern. The analysis only covered news published by county headquarters, the Budapest Police Headquarters and directly by National Police Communication service, but it did not include articles, reports or other documents documented with photos that were published on Police.hu, but under the auspices of *Zsaru Magazin* (*Cop Magazine*) (which also belongs to the Hungarian police as a weekly paper distributed by news agents and also as an online version). On the basis of the criteria listed above in total 448 articles were included in the analysis.

The analysis of the news included in the pattern began with categorization (it should be noted that certain news could be classified into more than one category, while there were duplicates and triplicates as well, i.e., news that covered the same case in various phases of the procedure, with the same text). The actors of the criminal stories can fundamentally be classified into the following groups: perpetrators (including perpetrators and suspects of crimes, offences and misdemeanours – 236 cases); victims (including actual and assumed victims in civil law and criminal law cases – 102 cases); and police officers performing actions and witnesses (as members of "other" categories – 3 cases).

In the categories of perpetrators and victims the news had to be classified further not only because of the high number of items but due to the complexity of the events: the second level of the categories was established based on the role played by the relatives mentioned in the news in the story. Consequently, the first category can be divided into the following

sub-categories: relative of the perpetrator as a victim (122 cases); relatives as accomplices (56 cases); relatives playing another role with the perpetrator in the story (58 cases). (It needs to be mentioned that the assumption in the background of the analysis, according to which police news occasionally refer to the background of the actors with additional information or specific expressions was the strongest in relation to this category, i.e., perpetrators.) The sub-categories of the second category are as follows: victims as relatives (37 cases); relatives as assistants of victims (20 cases); relatives of victims as reporting persons (23 cases); relatives appearing in other roles on the victim's side (58 cases). The establishment of a third level also seemed justified in the categories focusing on perpetrators and victims. At this level categorization was mostly based on whether the news covered an act against property or it was aimed against life, physical safety or integrity. In some sub-categories the third level of categorization was established on the basis of a further breakdown of the rule of the category. In the third category (news mentioning relatives of policemen and witnesses) no further categorization, i.e., establishment of sub-categories was established or justified due to the law number of cases.

A relatively small part of the news included in the pattern were not about crimes but about security measures taken by the police. Those news constitute the fourth category of the analysis (87 cases) and there were also news on accidents and unclear deaths, forming the fifth category (6 cases). (It also needs to be noted that in these categories some news covered events in relation to which it could not be excluded that a crime occurred in the background.) The fourth category can be broken down into sub-categories according to the type of the case in which the policemen included in the news performed security measures: assistance in providing emergency care (7 cases); assistance in relation to elderly people and ill people (47 cases); missing children (20 cases); assistance to intoxicated individuals (8 cases); prevention of suicide (5 cases). In the fifth category (accidents and unclear deaths) no comparison could be made according to sub-categories given the low number of cases.

At the micro level of the analysis, i.e. during the review of the occurrence, context and connotation of the search words the expression assumed to be stronger constituted the basis of the category of the news which contained more than one search words. (If, for example, one news article contained the words *kinsmen* and *relatives*, the particular article was analyzed among the articles that contained the expression thought to be stronger.)

Results of the analysis

The analysis of the 19 months did not refute any component of the hypothesis, i.e., pointed out that certain elements of the practice of Police.hu relating to the defined criteria could be suitable for conveying allusive messages to readers about the ethnic background of the actors involved in the news ort suggesting a position about the embeddedness and weight of certain social phenomena.

A few articles seem to confirm part of the hypothesis of the analysis according to which in the case of Roma the criminal news occasionally refer to the relationship between the actors when that information is not required for understanding the story. In the case of acts committed by accomplices (or more than one suspect) such news provide information on the fact that the people are kinsmen, while the other details of the cases (e.g., the location

or type of the act) also strengthens the probability that the reader will decode the text, i.e., will see Roma actors in the story. However, the limits of the content analysis method occur in the assessment of this element of the hypothesis, i.e., that everything which is outside the categories is lost of the analysis even if it is otherwise relevant. Within the framework of this case study the coding was based on five search expressions, although there may be some articles that also provide unreasonable information about the relationship between the perpetrators and thereby convey an allusive message about the Roma ethnicity of the persons, but it is indicated by a different expression and not by one of those listed above (e.g., *sibling, father*).

According to the other part of the hypothesis in criminal news there may be a correlation between the use synonyms relating to the relatives, and whether or not the actors are Roma. During the analysis a presumption developed that even if this tendency exists, it does not necessarily relate to the (assumed) ethnicity of the actors but also to their social status. In other words, there is a greater probability that certain synonyms will appear in the stories in relation to actors with low social economic status and/or Roma actors, while other synonyms will be used more often in relation to middle class and/or non-Roma actors.

Concerning the individual search words, according to a statement of the Bernáth–Messing research which inspired the hypothesis, it was general practice in the Hungarian media to use the expression *kinship* in order to suggest that the actors involved in the story are Roma. In the reviewed period the expression *kinship* occurred only in two articles on the police news portal. One of the articles covered an event in relation to which the police launched an investigation for the misdemeanour of vandalism: "In response to the lot of noise, the kinship of the victim ran out from the yard of the property of whom R.P. shook and pushed to the ground one woman." (Csongrád County Police Headquarters: *Befejezett ügy Csongrádon* [*Closed case in Csongrád*], 16. 07. 2014). The incident presented in another article was classified by the police as collectively committed vandalism: "[…] four men had a fight in Ady Endre utca during a family celebration. The drunken fighters were separated by the kinship" (Hajdú-Bihar County Police Headquarters: *Rendőrségi hírek Hajdú-Bihar megyéből* [*Police news from Hajdú-Bihar county*], 09. 06. 2013). Considering the social expectation for the neutrality of policy communication (which is also a basic principle according to the applicable internal policy of the police), both articles are problematic, especially when their wording is compared to the wording of other news: this is when it becomes obvious how much the objected wording pushes into the background the individualisms of the actors by depicting them as creators acting in mass.

Of the expressions that were examined the word kinsman showed some sort of correlation with Roma ethnicity and lower social status and various types of deviance. This correlation was observed not only in relation to the perpetrators but also to the victims and other persons plying a role in the story. Another observation must also be mentioned, according to which the more outrageous and bizarre a story is, the higher probably it that the story will include the expression of kinsman instead of the relative or family member. It also applies to stories where nobody is "innocent", at least according to the article on Police.hu. These include cases classified as group vandalism, for which an example is as follows: "due to their former hostile relationship they attacked and beat up a male kinsman at a […] fuel station who arrived there to fill up. They hit the victim on a number of occasions and, once he was on the ground, they also kicked him and then they also began to fight with a

male acquaintance who wanted to defend the victim." (Nógrád County Police Headquarters: *Csoportos garázdaság Salgótarjánban* [*Group vandalism in Salgótarján*], 21. 03. 2014).

An interesting image evolved around the expression *head of the family*, which was also involved in the analysis. According to the signs, this expression could convey a value judgment in police news: in the majority of cases it refers to negative actors, fathers and men who abuse their power position or have other dysfunctions. Examples of the use of the expression in that context: "In the heat of the argument the head of family broke plates and invited his son to fight." (Szabolcs-Szatmár-Bereg County Police Headquarters: Szabálysértési őrizetben [*In misdemeanour detention*], 16. 09. 2014). However, in other cases, when the victims are assumed to be Roma and/or low social status individuals, the same seemingly archaic expression has a special positive meaning: as if the emphasis of the role of the parties concerned in the family and community were included in the text in order to enhance the sympathy of the reader. This can be observed in the following text: "[…] they broke into the home of a couple in Ács, hurt them and threatened them to burn their house. One the head of family put the children into safety, he went to the […] Police Headquarters and asked for assistance from the police" (Komárom-Esztergom County Police Headquarters: Előzetesben a gyanúsítottak [*Suspects in prior detention*], 18. 10. 2013).

On the basis of the analysis another tendency can also be detected, namely that in relation to graver crimes and cases of greater importance more neutral synonyms appear more frequently; mostly the expression the *relative* is used. In addition, it is also generally used in relation to crimes, whose perpetrator should be clearly sentenced and the victim cannot be blamed according to the news. It may be stated that the expression *relative* is used mostly in news that cover the presented story objectively and seriously, (i.e., in a way which would be generally expected in the case of police communication). The following part of a news article is an example for this: "According to the statements, the usurers threatened their debtors and their relatives to be beaten up in case they failed to make the repayments" (Szabolcs-Szatmár-Bereg County Police Headquarters: Őrizetbe vették az uzsorásokat [Usurers arrested], 23. 04. 2014).

The indication of the relationship of relatives is not the only way to suggest the Roma ethnicity and/or low social status of actors or to convey hidden messages or undisguised attitudes. The role of the titles of the articles may be emphasized here, which on Police.hu often want to create a sensation. This indicates a major misunderstanding of the rule of the police officers who word the news and let their tabloid journalism ambition lose rather than following relentless objectivity, which is expected from the institution they represent. Here are a few examples of this phenomenon: Women's Day party ends in a loss (Veszteséges nőnapi mulatság, Békés County Police Headquarters, 17. 04. 2014); Looked for mother in the henhouse (Anyját kereste a tyúkólban, Borsod-Abaúj-Zemplén County Police Headquarters, 13. 02. 2014); Dispute settled with fists (Ököllel rendezték le a vitás ügyet, Győr-Moson-Sopron County Police Headquarters, 11. 06. 2013); Multiple guilt (Sok van a rovásukon, Komárom-Esztergom County Police Headquarters, 29. 12. 2013); Thief in love (Szerelmetes rabló, National Police Communication Service, 30. 10. 2014); Unfortunate thief (Peches tolvaj, Pest County Police Headquarters, 16. 07. 2013); Biting burglar caught (Tetten érték a harapós betörőt, Pest County Police Headquarters, 16. 05. 2014); Theft of a sibling's car (Testvére autóját „lovasította" meg, Zala County Police Headquarters, 15. 11. 2014). At this point we may recall the conclusion of the Bernáth–Messing research, which

inspired this case study according to which "tabloidization may be observed in Hungary for a long time, not only in the dynamic increase in entertainment programmes but also in the transformation of the news" (Bernáth, 2012: 48.).

Conclusion

During the assessment of the results of the content analysis it should also be mentioned that none of the news articles involved in the analysis included the expression *Roma*. Based on the *Roma* search word, only one criminal news was found on Police.hu during the 19-month period, according to which: "The perpetrators were 160–165 cm tall, chubby, good-looking men, aged 25–30, who communicated not only in Hungarian but also in Roma language" (Komárom-Esztergom County Police Headquarters: *"Újabb trükk, ami bevált: idős asszonytól lopták el a pénzét a trükkös tolvajok"* [New trick that works: tricky thefts steal money from an old lady, 17. 09. 2013]. In this news article the indirect reference to ethnicity is primarily of forensic science, i.e., investigation importance and not of criminology nature.

However, apart from the case discussed above, the expression *Roma* is also included in a number of articles not dedicated to criminal events; as an example, it is included in the news on the scholarship system that assist young people of Roma origin to join law enforcement agencies or the establishment of strategic cooperation between the police and Roma minority self-governments. In relation to the latter, a conceptional question is raised: why a minority self-government, i.e., an organization whose mandate involves the collective representation of identity-related rights (primarily language and cultural rights) of a particular national or ethnic minority group has any role in crime prevention, or in any area of social integration and what role it can play there (Pap, 2015). However, this issue goes far beyond the scope of police communication or the police. On the one hand, the mixing up of the legal and public political framework system of identity politics and social integration in relation to the Hungarian Roma could already be observed in the process of joining the European Union (Vizi, 2013); on the other hand, the phenomenon of securitization can also be detected in this tendency and, from the aspects of human rights and based on international experience, all this raises concerns about the attainment of the objective of social inclusion.

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István Sabjanics

Fear as a Source of Threat with Legal Consequences[1]

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Abstract

This short essay focuses on fear which has its effects on politics, national decisions, and last but not least, on lgislation. Legal philosophers have long been discussing the differences between the legal (sollen) and the physical (sein). Telecommunications and globalization have had an amplifying effect on fear and politics. National politics stayed within the borders until the second half of the 20th century (with the exceptions of minorities living in neighboring countries), but nowadays fear (or dealing with fear at least) has its place in international politics. Terrorism is one of the sources of this fear existing in politics. Besides politics terrorism has great effect on legislation, which can be direct, undefined or hidden. Hopefully this short paper provides some food for thought until the online version, without length restrictions, is available.

Keywords: external and internal dangers, formal legality, transition between the branches of law, purpose and subject of regulations, common good, social legitimacy, legal transplantation, canon

Introduction

The title of this book may lead unsuspecting readers to expect warnings in a military, policing, or national security context, even though there are countless threats that remain mostly unnoticed in common processes and developments. Such hidden threats can have an even more corrosive impact on democracy than one would think at first, as they exert their destructive force continuously and over a long period, becoming natural and integral parts of our daily routines to such an extent that we are more likely to notice their absence than their presence. In contrast to direct threats that are easier both to comprehend and detect in the physical world, forces with an impact on the depth and outcome of political

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decision-making might be more dangerous because they could change the quality and the very nature of a functioning system eventually. Such forces often prevent ex-post revision as well, since the relevant stakeholders are rendered unable to even recognize the issue. The role and tasks of governments have been defined in the course of organic social development, and the opinion of society on the government also provides useful feedback. This organic development and the consistent opinion of society on its government give and define the true identity and immunity of a political system (Pedahzur, 2002).

Special legal order

A democratic institutional framework is capable of effectively resisting external attempts to introduce any change by force, but it has a more difficult time when facing trends and processes that seek to erode democracy from the inside. Thus, the possible political impact of an actual or presumed threat is of great importance, and the primary question is whether or not the threat proposes a political alternative.

A democratic system may respond to physical threats in two fundamental ways: (1) it introduces special rules as parts of the legal system, thereby moving the threat into the realm of the law, making it comprehensible, understandable, and regulable for and by means of the law, or (2) it restricts the rules of democracy for the duration of a threat and seeks to resolve the critical situation by means beyond the realm, but used for the purposes, of the law. In the latter case, such paralegal means and solutions should be selected pursuant to the requirements of the rule of law as much as possible, as the measures taken and not taken will be assessed during the ex-post review of the events with regard to the requirements of the rule of law (Hussain, 2003). An effective means to this end could be a gradual and progressive use of power either guaranteed by normative rules or assured by the temperance of the (almost) omnipotent person in power. Less pragmatic, but deeper considerations may also play an important role in selecting the means to be used under a special legal order, such as the *spirit* of the rule of law. In short, the farther we stray from the rule of law, even if to preserve it[2], the more difficult it is to find our way back.

On the basis of the above considerations, legislatures strive to adopt a normative description of various threats, thereby reinforcing their value-based ties to the rule of law by introducing procedural frameworks as well. It may be hard to tell if the value-based or procedural approach provides greater protection, but it seems clear that the individual valour and integrity of persons maintaining a system following the value-based approach plays a more significant role, than in a procedure-based system, as such systems may be influenced by courts and judges indirectly at best. Another important sign is that the normative rules pertaining to a special legal order are normally adopted at the level of constitutions. This fact (1) indicates the significance of the normative goal, (2) raises such special rules to the highest regulatory level of legal order, meaning that special legal orders are recognized as actual alternative legal orders (apart from the very core of constitutional rules), and (3) sets up a normative framework both for introducing a special legal order and for returning to the normal legal order. The degree of democracy's immunity should also be assessed on the basis of the above considerations (Sajó, 2006).

[2] Cf. the defence function of government (Fleiner-Gerster, 2003).

The description of threats in a normative manner does not seem to pose a threat to, but seeks to reinforce, the rule of law. However, it is just natural that any rule adopted in the constitution may bring along various new rules that eventually become parts of the legal order in the wake of foreseen legislation. There is an apparent gap between normal and special legal orders, and the separation is usually also quite clear from the wording of a constitution. Pieces of legislation constituting a normal legal order are enforced during special times subject to, and together with, the rules introduced under the special legal order (with the exception discussed later), while the rules adopted under a special legal order are generally repealed when the normal legal order is reinstated. While some exceptional examples to the contrary were seen between WWI and WWII[3], returning to a normal legal order usually means both that the normal organization of government will be capable of handling conflicts that may arise later on, and that it is supported by a solid consensus in society. Under such circumstances, it seems unusual that a piece of legislation introduced under a special legal order is preserved due to a regulatory necessity or its political legitimacy. Thus, the legislative approach to actual or presumed threats that do not justify the introduction of a special legal order pose far larger challenges to the cohesion of a legal system, than any rules introduced under a special legal order does.

Legislation

The purpose of legislation is to adopt a formal and normative description of (regulatory framework for) reality for the future (Szabó, 2001). Having a formal framework means both that legal provisions are adopted by a body duly vested with legislative powers[4], which also has due political legitimacy, and that the proceeding of that body is in line with statutory provisions on legislation, i.e. laws are passed and promulgated by the authorized body pursuant to the required procedure (this is the legally defined aspect of a formal framework). In other words, laws have *formal validity*, if they meet the above requirements both politically and legally.

Adopted pieces of legislation also have *sociological validity*, a term essentially referring to the binding nature of formally valid laws having regard to the degree a piece of legislation is actually followed by members of society. While this dimension of a law could depend on the regulated subject matter theoretically, the sociological validity of a law society does not generally support (e.g. mandatory provisions on public contributions) is ensured by law enforcement. From another perspective, if a law hardly has any impact on the daily life of people, even indirectly (e.g. internal rules concerning the operations of public administration), indifference poses a far more significant threat to its sociological validity than, for example, active resistance.

In a normal legal order, the primary objective of the law is to maintain and preserve the existing social and economic order. The objective and primary task of norms adopted under a special legal order is to facilitate the return to a social and economic order that character-

[3] E.g. Act VI of 1920 on extending the period of exceptional powers granted during the period of war; Act VII of 1945 on re-enacting government decrees issued on popular jurisdiction as acts of parliament; Act XI of 1945 on the temporary consolidation of the exercise of state powers.

[4] The national assembly or cabinet, typically.

izes the normal legal order (cf. Jakab–Till, 2014). This is a substantial difference because, *a contrario*, it also means that the purpose and subject-matter of legislation is not necessarily the same under a special legal order. This last sentence needs some further explanations.

It seems clear that both the norms adopted under a normal legal order and the norms adopted under a special legal order become law. Pursuant to Article T (2) of the Fundamental Law of Hungary, decrees of the National Defence Council adopted during a state of national crisis and decrees of the President of the Republic adopted during a state of emergency shall also be laws. This means that both kinds of decrees become norms of general binding force, which may even suspend or restrict the exercise of certain fundamental rights (pursuant to Article 54).[5] The adoption of pieces of legislation is thus subject to both form and content related requirements, even under a special legal order. A duly authorized legislative organ may adopt a norm, but the grammatical, systemic, logical etc. requirements and the guarantees of access, which are normally applicable to all pieces of legislation, remain applicable. Nonetheless, the objective and subject-matter of the regulations is different, due to the very reason because the validity of laws passed under a special legal order is limited to the duration of the special legal order. In comparison to the temporal scope of laws adopted under the normal legal order, it seems clear that the limitation of the temporal scope of *ordinary* laws adopted under the normal legal order depends on a condition that is already known even when a given law is passed. This remains true even if a given piece of legislation is amended or even repealed subsequently. On the contrary, the temporal scope of *extraordinary* laws is subject to the same condition that necessitated the adoption of the legislative act.

On the basis of the above considerations, it appears on the one hand that, in a normal legal order, the relationship between the objective of a norm (i.e. to preserve and maintain the existing social and economic order) and the subject-matter of a norm (i.e. the normative description of a specific segment of the existing social and economic order) is the same as that between the whole and its parts; the objective is closely related to the subject matter of the norm. On the other hand, the objective (i.e. to eliminate the reasons for introducing the special legal order and return to the normal legal order as soon as possible) and subject-matter (again, the normative description of a specific segment of the existing social and economic order) of laws adopted under a special legal order, even if they might point to the same direction, are clearly separated from each other.

Legislation may be fundamentally characterized by that (1) it seeks to adopt normative rules deliberately, (2) it focuses on the future, just like public administration, and seeks to shape the future by regulating the present, (3) it introduces general provisions instead of dealing with individual and unique situations, (4) it creates a solid set of rules, and (5) it is also characterized by a certain degree of static existence (Szabó, 2001). In the context of

[5] Article 54 of the Fundamental Law of Hungary
"(1) Under a special legal order, the exercise of fundamental rights – with the exception of the fundamental rights provided for in Articles II and III, and Article XXVIII (2) to (6) – may be suspended or may be restricted beyond the extent specified in Article I (3).
(2) Under a special legal order, the application of the Fundamental Law may not be suspended, and the operation of the Constitutional Court may not be restricted.
(3) A special legal order shall be terminated by the organ entitled to introduce the special legal order if the conditions for its declaration no longer exist.
(4) The detailed rules to be applied under a special legal order shall be laid down in a cardinal Act."

special legal orders, legislation, similarly to public administration, also gains an operative dimension, meaning that the relative significance of tactical, specific, and sometimes almost individualized and unique legislative approaches increases in comparison to other strategic, comprehensive, and concept-focused approaches. At the same time, the somewhat static existence of previous times is replaced by a certain legislative dynamism, which in turn may not jeopardize the stability of the legal order. Such differences are clearly evidenced by the fundamental differences between the legislative processes (in terms of deadlines, drafting, debate, adoption) followed by entities playing a significant role under a special legal order (National Defence Council, President of the Republic) and other entities with a legislative role under the normal legal order (National Assembly, cabinet).

The ex-post assessment of presumed or actual threats that do not justify the introduction of a special legal order, as well as of the emergence and handling of the threats that resulted in the introduction of a special legal order is usually carried out by way of *targeted retrospective legislation*, which may bring about fundamental changes in the legal system. The revision of threat-related legislation is also likely to result in a systemic modification of the legal system, meaning that the laws passed with regard to a threat are seldom ad hoc in nature. A (legislative) event fits into a patter and, as such, may be foreseen, even if certain special rules are tabled as independent legislative motions, or if a regulatory need (or need for an amendment) is raised by a local government instead of the cabinet. As a matter of fact, the legitimacy of an adopted special rule is not affected by the identity of the person or entity launching or initiating the legislative process. However, it is important that there must be a direct causal relationship between the danger that passed and the purpose of legislation. The *sense of danger* remains capable of influencing the behaviour of persons and bodies involved in the legislative process and the legislative process itself, even when the actual danger has already passed. If there is pressure from society and politics, the persons involved in the legislative process are unlikely to take all the time allowed to them in the legislative process; they are more likely to limit the number of persons and entities consulted to the legal minimum, thereby limiting the number of persons involved in the process both vertically and horizontally. Naturally, such behaviour increases the likelihood of errors, opening the gate both to accidental typos and to other substantial (content-related, systemic etc.) mistakes that could jeopardize legal certainty.

It seems both to be a requirement and a basic principle that the legal order should reflect reality under normal circumstances. In other words, if there is a significant difference between the normative realm and reality, the former must be adjusted. Conversely, it seems possible that a legislature may attempt to use normative means to adjust (influence) reality if necessary. References to the common good (meaning in this context a goal that is useful for the community, i.e. society) may make otherwise unpopular laws appear more appealing during the social debate leading up to their adoption (Arkes, 1998). The goal of laws and the essence of the common good implies that they seek to increase the common good of the people. The human condition seems to mean, among others, that people achieve the purpose of their existence in full through the functioning of society; for this reason, a system that attacks the individual existence of a person and enslaves him by melting him into a collective social existence, i.e. any collectivist totalitarian system, is based on false foundations (for the purposes of philosophical anthropology, among others). Consequently, the common good must be aligned with the good of individuals, thereby serving as ground

for the sanctity of the freedom of conscience and religion, as well as private and family life (Frivaldszky, 2013). However, the fundamental interest of individuals and communities in their existence and survival frequently clashes with the desirable harmony, and fear is capable of tipping the balance in favour of systems that systematically and fundamentally violate the personal dignity of individuals. Legislatures may not unsure the validity of their laws under natural law simply by invoking the common good. For non-lawyers, disregarding an apparently unfair law is not that big of a challenge, as it lacks a natural and inherent component that would be required to make a piece of legislation morally valid. However, the problem lawyers need to face is more complex, as a piece of legislation becomes binding automatically once it is adopted (debated and promulgated) in a valid manner, since the binding force of laws is rooted in their validity (Szigeti–Takács, 2004). The acceptance or recognition of the theoretical option of individual review would jeopardize legal certainty, even if it appears in the form of the avoidance or circumvention of a law or civil disobedience. Grossly unjust and unfair events can take place when fear appears under such circumstances (for example, in an actual crisis situation), considering that private justice and excessive use of force by the armed forces seem to commonly appear in such situations.

Fear

Fear is a term that is hard to define for legal purposes, but the *lack of security*, as a component of fear, might offer a useful alternative. Attempts at defining "security" and the "lack of security" commonly focus on the correlation between the two terms (Ádám, 2005), and the same approach may be used to consider the meaning of "fear" and the "lack of fear", i.e. the sense of security. The statistically confirmed deterioration of public security inevitably results in more stringent criminal legislation (a good example is the social debate prior to the introduction of the "three strikes" rules), which tends to become a political factor in and of itself. This is a normal process, considering that, in a community, decisions on social coexistence and the preliminary social debates (common thinking) always has been part of the realm of politics. Thus, the political initiatives with the strongest social legitimacy are the ones that can rely on and represent the widest social need (demand) with a message or agenda. According to Karl Renner, legislation is the primary and most suitable means of solving social problems and tasks, and controlling society.

The purpose of legislation is to preserve and maintain the governmental, social, and economic order by normative means (i.e. by prescribing rules and regulations). A new law changes the legal system whether or not it operates as a code to encompasses all distinctive features or a given legal field, or it merely introduces minor changes to fine-tune some technical rules. The behaviours prescribed in a normative manner become reality through enforcement sooner or later. This means that laws that take into account factors other than their normative goal (think of laws adopted under a special legal order or under considerable social pressure) will also have a more complex impact on the legal system. Such additional factors may remain hidden and may go unnoticed, but they do become parts of the legal system; even if they work in more subtle ways than the written law, their spirit does have an impact on the future interpretation of the law.

In terms of their origin, presumed or actual threats can be internal or external threats. A threat is real, when it is rooted in an actual and existing phenomenon; it does not matter in this context, if the threat is generally known in the political community. A presumed threat may be either a fictitious threat or a non-professional assumption (in contrast to expert assumptions that can reliably suggest the presence of a threat), where the threat either does not exist or does not reach the degree it is thought to reach. *Scaremongering* (the spreading of frightening rumours as defined by the Criminal Code) is a means typically used by persons seeking to achieve a result (e.g. shaping the public opinion) by influencing the general public (as a means).

The *internal sources* of presumed or actual threats include, among others, conflicts between nationalities and religious groups, social tensions, constitutional crises, xenophobia, and terror attacks. Similarly, *external sources* of such threats might include religious wars, ethnic cleansing, historical demands, taking action at international level, economic interests, and other interventions by the government. Apart from the countless specific sources of threat, three general groups of sources of threat can be identified: (1) domestic political interests (internal, political), (2) common cultural traditions (external, traditional), and (3) relations between allied countries (external, political). Domestic political interests have already been discussed. Common cultural traditions (such as nationality, language, legal tradition, and religion) connect countries and societies in a way that may serve as ground for beneficial cooperation and useful novelties, but they may also cause danger and threats. For example, English and French speaking countries that take the hardest action against international terrorism are facing the very same threats, regardless to the actual extent of the involvement of individual countries. Such cultural traditions are supplemented or, in the absence of cultural relations, even replaced by the international legal relations of allied nations, as they formalize the roles of countries taking actions against terrorism under international law, and also make such countries targets for terrorists once and for all.

The impact of fear on legislation

There are three consequences of *codifying fear*[6], i.e. to pass laws led by fear from presumed or actual threats:

1. Need to set a standard. Extraordinary regulations (the introduction of new or more stringent rules), even if used in a targeted manner to solve a specific problem, tend to gain a general dimension and become part of the legal system due to their normative nature. If successful (i.e. if the desired effect is reached and the threat is eliminated), the rule becomes the minimum standard for security, and subsequent pieces of legislation (passed on the same subject-matter) will be compared to it.

[6] The author used this term for the first time in his speech *"A tömeges bevándorlás okozta válsághelyzet, valamint a különleges jogrend és a határokon átívelő jogalkotás gyakorlata"* (The mass immigration crisis, special legal order, and the practice of cross-border legislation) delivered at the *"Globális migrációs folyamatok és Magyarország – Kihívások és válaszok"* (Global migration trends and Hungary – Challenges and responses) conference (Budapest, 16 to 17 November 2015) held at the Hungarian Academy of Sciences, where he also spoke about external and internal threats.

2. Overlaps between legal branches. Pieces of legislation adopted with regard to security, threats, and fear may appear in any branch of the law, but they typically use different wording and legal solutions in line with the distinctive characteristics of the legal branch concerned. In this context, solutions that may be somewhat alien to a given branch and tensions that may arise between a specific wording and the broader legal environment are usually regarded as codification errors made by the competent bodies. Such criticism is justified in part, since laws and regulations should not be amended (deformed) with regard to certain aspects of a given legal branch only, but they should be adopted in a manner that both takes into account such aspects and fits into the legal system smoothly.

3. The phenomenon of transplantation (Donohue, 2012), taking place through the following phases.[7] (a) By way of adopting a piece of legislation, the *direct intent* of a legislature is to have the adopted norm become part of the legal system and exert its legal effect pursuant to the criteria presented to the public during a social debate. (b) Through the adoption of the norm, the legislature influences the existing legal order directly, as new pieces of legislation are usually more than one more *copper plate* in addition to the existing ones, and they also have an impact on already existing pieces of legislation (modify or repeal such norms). (c) However, legislatures tend to ignore the indirect effects of passing laws, even though such laws, like pebbles thrown in a lake, have a legislative "ripple" effect and may cause more and more waves of legislative effort. (d) Finally, legislation becomes more and more extensive and eventually covers fields that are not even indirectly related to the original (current) social debate, but the passing of such laws goes unnoticed in the queue of new legislation, satisfying a social need for the (statistical) success of legislative efforts.[8] This seems particularly relevant where legislation is based on fear from a presumed or actual threat and the legislature simply rides the waves of such fear (even though seemingly acting with regard to that very fear). Under such circumstances, the political validity of the adopted norms seems questionable even though they have a strong legitimacy and a formal legal validity. A "vacuum effect" (Donohue, 2012) is quite likely to appear in the two latter cases, where, in order to facilitate the application and enforcement of the new norms, the amendment of existing rules becomes necessary, even if such a need is not clear in advance. This means that thematic legislation (i.e. legislation directly related to a given subject-matter), even if it is planned to have a one-time impact on the legal system, might force the legislature to follow a path determined by a continuous need for re-calibration for years.

During its existence of over a thousand years, the Hungarian legislature tackled countless challenges successfully, either by passing formal norms or through the domain of legal traditions and practices. The right approach appears to be to keep an eye on trends and act in a sensible and flexible manner, so that ex-post revision remains a possibility, instead of insisting on following the old ways. The possibility of ex-post revision is of utmost importance, as a closed democratic institutional setting may cause its own demise by excluding the possibility of such revision.

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[7] The term *"transplantation"* was coined by Donohue in legal literature in the context of latent aspects pertaining to legislation, which may not form parts of the ordinary legislative process but have a considerable impact on the outcome of the proces through their sensible presence. The referenced essay examines criteria that influence security-related legislation.

[8] A kind of sneaking legal harmonization.

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Tekla Sebestyénné Szép

The Theory of Energy Security in Economics

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Abstract

The examination and assessment of energy security in economics is not an entirely new phenomenon; similar studies were first conducted in the early 20th century. Nevertheless, for the past decade its importance has significantly grown, and many types of aspects and approaches have been developed. In this study, after the presentation of a historical overview, we introduce coexisting definitions and different interpretations. We provide an overview of the 4A conception, that is the 4 factors of energy security issues, and furthermore we present the main dimensions of the analysis and the procedure of risk assessment and evaluation.

Keywords: energy, energy security, vulnerability, resilience, sovereignty, robustness

Introduction

The development of energy use has seen through the history of humanity: the discovery of fire provided our ancestors with energy sources; biomass-, wind-, and hydropower dominated energy use until the 17th century. The era of fossil energy sources started with the invention of the steam engine (and the intense use of coal). The usage of petroleum and nuclear energy then opened up new opportunities in energy production; and transport became cheap and available for everyone. The spreading of electric energy significantly improved living standards. It is no coincidence that even today, one of the measures to indicate societal progress is the degree of access to that kind of energy. We cannot make ourselves independent from its use; and it indirectly also shows the level of our economic growth and development. So, when the scarcity of resources is becoming ever more urgent, the issue of security of energy supply arises.

The short history of the development of energy security

In the first half of the 20th century, the concept of energy security was evoked primarily due to worries about coal- and petroleum supplies for the marine fleets and the armies. At that

time, political and military leaders wanted to ensure the security of energy supply through the following measures: diversification of supply, replacement of the import by domestic production, limitation of energy use that was not of primary necessity, and military control over energy sources and the infrastructure (Cherp et al., 2012). In the second half of the 20th century, petroleum became the primary driving force of national economies. Many of the developed countries faced the issue of increasing oil import, and, in the 1970's, the oil embargos put the focus of interest on the issues of energy security. Various index numbers and strategies were elaborated, focusing on the cooperation among the OECD countries, the enhancement of energy efficiency, and the exploration and exploitation of oil fields outside OPEC member states. By the millennium – thanks to the above strategies – fears related to the disruptions of global oil supply decreased; however, the number of security issues regarding electricity supply – especially the operation of nuclear power plants – had grown sharply (Cherp et al., 2012). The topic of energy security within economic science has widely expanded by now: beyond the security of demand and supply, it covers e.g. the analysis of the effects of price changes, energy poverty, geopolitical risks, and the effects of climate change.

Definitions

There are many approaches regarding the notion of energy security. The International Energy Agency (IEA, 2016) defines energy security as "the uninterrupted availability of energy sources at an affordable price". According to the *Green Book* of the European Commission (2000: 1.), energy security is the uninterrupted physical availability of the energy sources at affordable prices, having regard to the environment and the principles of sustainability. According to Brown et al. (2003: 21.), it is a robust energy system, which is the combination of active, direct and passive, indirect (e.g. diversification) tools, by which tools the system is able to tackle current threats. Winzer (2012: 36.) found 36 different definitions of energy security; and, as a conclusion, defines energy security as: "the continuity of energy supplies in relation to demand". In this case, energy supply includes the exploitation, transportation, distribution, and end use of energy sources. This may involve huge distances, crossing national borders (Mansson et al., 2014).

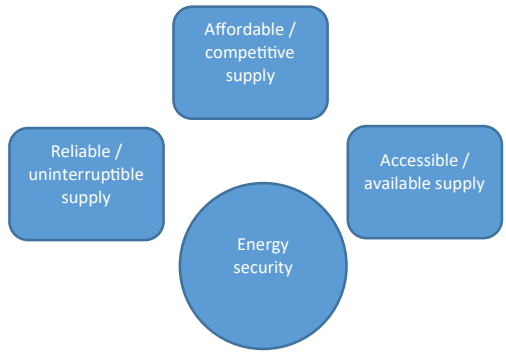

Figure 1
The factors of energy security

Source: Own editing, on the basis of IEA (2016)

In the long term, energy security means all the investments which, if carried out in time, ensure that supply can meet the demands arising during economic development (having regard to environmental sustainability). In the short term, it means the ability of energy systems to immediately react to any sudden changes, keeping the balance of demand and supply. The degree of energy security will not be satisfactory if the energy is physically not available or is sold at a price which most role-players cannot afford (IEA, 2016). This leads us to the 4A concept, which includes the following factors (APERC, 2007): 1. *affordability,* 2. *availability;* 3. *accessibility;* 4. *acceptability.* Let us note here that in this case, affordability is a subjective notion, and means price stability, competitiveness, and protection from energy poverty (Jewell et al., 2012) (Figure 1).

Even though there is no agreed definition of energy security, there are many approaches regarding its wider interpretation and its analysis. Experts have various opinions as to whether economic, environmental, and social factors should be taken into account in the measuring of energy security. According to Alhajii (2007), the answer is Yes; furthermore, he ranges also technical, foreign policy (and other international), and national security factors among the dimensions of energy security – and, according to him, these factors shall also be included in the analyses. Vivoda (2010) emphasizes that conventional energy security approaches have hardly any regard to people. In his study he explains that the population's access to energy is also a key factor (e.g. considering the degree of energy poverty). To what extent a country is willing to cooperate internationally in various fields (e.g. in the field of greenhouse gas reduction efforts in relation to climate change) shall also be examined. According to Vivoda, the commitment of a country to energy security is well characterized by the fact whether it has a consequent, well-delineated national energy security strategy, and what PR is attached to that policy.

Another key aspect is geographical delineation; where the analysis may start from huge geographic regions and go down to the level of families (however, the most widely applied analyses are on national level, because the states are responsible for the stability of energy supply). It is important to define the time period of the analysis and to take the nature of

risks into consideration (Jewell et al., 2012). Basically, there are two important elements of dangers to energy systems, i.e. risks: a risk is the damage caused by an environmental incident or by human activities (or both), or the likelihood of possible consequences (Molis, 2011). Analyses may focus on the primary energy use, the secondary energy sources, but they can also be differentiated on the basis of end use. Let us note here that, even today, most of the analyses regarding energy security are related to petroleum, namely its price changes, the stability (both political and economic) of the producing countries, and the vulnerability of the transportation infrastructure. The main cause of that is the fact that petroleum is still the basis of the lifeblood of the economy: In 2013, more than 45% of the world's energy usage was supplied through petroleum sources (IEA, 2015). Approximately 60% of this amount reaches the users through international commerce (Gupta, 2008). This fact illustrates well that it is a materially global product (Table 1).

Table 1

Aspects of the analysis of energy security

The dimensions of energy security	Geographical delineation	Time span	The nature of the risk	The nature of the energy source / energy use
• economic • environmental • social • (other, e.g. technical, foreign policy, national security)	• national • regional • local	• short-term • long-term	• geopolitical • technological • environmental • economic	• primary (e.g. petroleum, natural gas, coal) • secondary (e.g. electricity) • end use (e.g. industry, transport, household sector)

Source: Own editing, on the basis of Jewell et al., 2012

The method of analyzing energy security

Jewell et al. (2012) identifies energy security as the low risk of any disturbances of the operating energy systems. On the basis of that, − adding the methodology of Molis (2011), − the main steps of risk analysis are the following:

1. identification of the energy system (i.e. the determination of the analysis aspects of energy security);
2. identification of the dangers (if possible) and estimation of their severity;
3. examination of the vulnerability of the system;
4. determination of the indicators necessary for the calculation, and the estimation of the risk on the basis of the severity of damage and the likelihood of occurrence.

Generally, the vulnerability of a system and the degree of that can be characterized by an external effect (shock): vulnerability is high if a small external effect would cause serious damage (Christie, 2009). According to Flaherty and Filho (2013), vulnerability itself comes from the uneven geographical dispersion of energy sources. We distinguish three aspects of it: sovereignty (the possession of energy, primarily related to the institutional background, and it is considered to be the independency of the energy system), robustness (the tolerance, "insensitivity" of the infrastructure against changes), and resilience. The latter, generally, means the flexible ability of resistance, i.e. the reactive ability of a system to adopt to an external, shock-like impact (Rowies, 2015). In the analysis of long-term energy security, all three aspects shall be taken into consideration; however, we note here that they are mixed in many cases and are hard to separate. Sovereignty has been included in energetic analyses for about a 100 years, and its importance is probably not going to decrease in the future, either (Jewell et al., 2012). In the analysis of sovereignty, we primarily focus on the potential disturbances that may occur due to an external entity. This is related to terrorism, unreliability of exporters, and the activities of foreign energy companies or other market role-players with a significant power (e.g. the OPEC). The most important method of preserving sovereignty is the possible fullest control over energy systems, in military, political, economic, and technical sense (Cherp et al., 2012). As energy systems are becoming ever more developed, dynamic, and integrated, the significance of robustness is becoming more and more important. In the examination of robustness, the experts mainly focus on the problems arising as demand grows: the scarcity of resources, and the insufficiency of infrastructure and capacity. Solutions to these might be infrastructural investments, the preference for other, easier available and more secure energy sources, and the enhancement of energy efficiency.

Vulnerability to oil markets

Having processed the available literature, we have come to the conclusion that most of the vulnerability assessments are related to oil market vulnerability. No agreed definition of vulnerability to energy issues and oil markets has been elaborated so far. Oil vulnerability can be interpreted as a multi-dimensional notion, mostly dominated by the point of view of importing countries. There are two species of vulnerability: vulnerability against changes of oil prices (market risk), and exposure to other shocks occurring on the supply side (risk originating at the supply side, e.g. geopolitical conflicts, the amount of reserves). Furthermore, there are environmental risks, e.g. related to climate change, global warming, environmental pollution. At the time of increasing oil prices, most of the researches focus on the oil importing, developed countries, and the various risks and indicators of vulnerability are related to these countries. In the periods of decreasing oil prices, the viewpoint of oil producing and exporting countries dominates. We can find a wide range of approaches – such as economics, national security, geopolitical, environment ecological works. We must note that, in the analysis of vulnerability to oil markets, most researches identify the energy security as energy independence; and they think it can be achieved through the reduction of energy import and the increasing of diversification (both in the energy mix regarding the suppliers). At the same time, Cohen et al. (2011) highlights that greater dependency

on a single supplier means less energy security; however, the vulnerability itself will not necessarily be higher. Therefore, these two notions should be examined separately.

Risk assessment

During the assessment of possible damage and the external impacts, several factors shall be taken into consideration. The following shall be assessed:

- the degree of the impact (threatening change, little change, periodical change);
- the speed of its spreading (constant, slow, or quick change);
- temporality (temporal, long-lasting, continuous);
- extension (local, national, global);
- uniqueness (unique, rare, often);
- the nature of connection (deterministic, stochastic, heuristic, unknown) (Winzer, 2012).

The degree of the risk may be of three levels: acceptable (in this case, the likelihood of the event is low, and the damage potentially caused is negligible); tolerable (here, the likelihood of the event is higher, but it can be evaded through preliminary measures), and intolerable (where the event will likely happen, and the damage is considered serious) (Molis, 2011).

According to the results of risk assessment, *the methods of crisis management* can be summarized as follows, according to Brown et al. (2003):

- Various scenarios shall be elaborated for the potential crisis situations (and the already existing ones shall be continuously updated). The aim is to make these as flexible as possible. Each energetic crisis is unique, and demands different combinations of the available assets and measurements.
- Decision making – during a crisis – shall be delegated to the lowest possible level. Most of the decisions can be made on the local level; however, communication with the competent organizations is of utmost importance.
- The key role-players of decision-making shall be identified, and they shall know each other.
- In the elaboration of scenarios, the governments shall cooperate with industry experts, since the knowledge and expertise of those working in the oil-, gas-, and electricity sector is essential.

Summary

Energetic developments have always been a part of various political programs, due to the concerns about the sustainability of energy systems. Energy security is connected not only to the nation's but also the personal security. In a broader sense, it affects the security of nations, from the risk of armed conflicts to the development of national economies and to the stability of political systems. Thus, it is closely linked to not only national security, but also foreign policy, and various commercial-, development-, and investment policies. We think that the widest possible scope of examination aspects shall be involved in the assessment

of energy security. At the same time, it is a difficult task to find the boundary between the relevant and the less important aspects, so you will need to clearly identify the objectives of the assessment to delineate the boundaries of the system.

Our summary was dominated by economic aspects, but the findings of other science fields also need to be involved. The unpredictability of the future, and the dynamics of the international relations makes the planning of energy systems more difficult: potential threats must be identified on the basis of the available (and never complete) information. However, possible responses and the assets can be improved through continuous assessments, and the flexibility of the system can be enhanced. Political decision-makers play a key role in energy security; as they are the ones who have information about the whole system, and they are responsible for the synchronization of the activities of people working in the sector.

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Margit Schütt

A Possible Way (Out) from Insecurity Towards Economic Security
On the Basis of the Experience with the "Way-Out Programme"

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Abstract

The concept of security has changed significantly since the 1990s, the years marking the end of the cold war and the bipolar world order. The new concept of security is determined by Barry Buzan (Buzan, 1983). In his multi-dimensional model the idea of economic security means, among others, financial and market possibilities and welfare (Gábri, 2010: 113.). Regarding economic and social security, it is vital that people living in poverty and exclusion should not feel existentially threatened.

By the example of a special self-employment programme (namely Kiútprogram, "Way-Out Programme") I argue that a certain level of economic and social security can also be achieved by targeted, local programmes for this segment of society. Verifying my hypothesis the programme will be introduced and shortly evaluated in this paper. The method of this research included direct observation (I was involved in the programme as its CEO and as the member of the board) and empirical survey.

On the other hand, the majority of society feels threatened by people living in poverty and exclusion. There is a need for security on their behalf too. There is broad consent in available literature that viable solutions for this problem fall in the following two categories: either the economic and social differences should be decreased or the role of welfare state and social policy should be renewed. At the same time, "politicians of both sides have argued that tax-payers cannot on the long run be expected to finance the non-working-part of the society". (Virág, 2014: 46.). I argue that these non-working people are capable of sustaining themselves as entrepreneurs improving their own circumstances.

Keywords: self-employment, micro finance, poverty, Roma people, social inclusion, economic security

Introduction and research hypothesis

This paper is an intermediate product of an ongoing research programme. Consequently, it does not contain a comprehensive description of *"Kiútprogram"* from every angle of relevance to the research. Here I analyze the possibility of achieving security – particularly, economic security – through the programme. In the context of a new, extended interpretation of the concept, instead of its conventional, narrow sense, the state is no longer the only possible provider of security. It is therefore a relevant question whether extra-state structures can be effective and guarantee security and whether such structures can actually have an adequate "weight".

When the initiators of *Kiútprogram* (a foundation called *Polgár Alapítvány az Esélyekért – Polgár Foundation for Opportunities* – and a number of private individuals) worked out their proposal concerning a social micro-lending model in 2008, based on international experience (Yunus, 1999; Cull et al., 2007; Forster et al., 2003; Ledgerwood et al., 1998), it had already become clear that economic and social inequalities were being reproduced even despite the system change (democratic transformation) of 1989. The presence of an uneducated and untrained social group, comprising mostly people belonging to the Roma community, whose very existence was under constant treat, had also become unquestionably clear (Spéder, 2002; Kertesi, 2005; Köllő, 2009; Dupcsik, 2009). The industries, particularly construction, which used to employ, and provide income for, large masses of this social group, had collapsed by that time. The survival of such people and their families was guaranteed for a while by unemployment benefits and, later, a variety of social allowances and occasional employment, because the active labour market offered no opportunities for them. Breaking out of this hopeless situation is also hampered by the lack or low levels of mobility. Accordingly, renewed problems of poverty and social exclusion had to be faced again, 19–20 years after the system change and 4-5 years into Hungary's EU membership. The poverty rate[1] according to data from the Hungarian Central Statistical Office (HCSO), was 12.4% in Hungary in both 2008 and 2009, below the EU average, ranking Hungary among the "less poor" countries of the Union. Looking beyond poverty in terms of income to scrutinize work intensity[2] and deprivation[3] as well, it is found that the ratio of those affected by at least two of the three indicators is significantly higher, at least a third of the Hungarian population (among children it is over 40%).

[1] The proportion of those living in households on incomes below 60% of the equivalent income median, which is one of the so-called Leaken Indicator system, is an indicator of income poverty (based on HCSO methodology).

[2] *Work intensity:* It compares the time spent by every working-age member of a household working, with the total time that can theoretically be spent working, during the reference year. It varies between 0 and 1 (0 being where nobody works, while one is the indicator where everyone works in full time jobs throughout the year) (based on HCSO methodology). *Very low work intensity:* Individuals of 0-59 years of age, living in households whose working-age members (aged between 18 and 59) spent less than 20% of their potential working time at work during the previous year (indicator: 0–0.2) (based on the HCSO's methodology).

[3] People facing at least 3 of the following 9 problems are considered to be living in financial deprivation: 1. having past-due debts in loan repayment or other financial arrangements for housing; 2. lack of adequate heating in their homes; 3. no reserves for unexpected expenses; 4. no meat, fish or equivalent food on the table at least once every two days; 5. no holidaying for away from home at least once a year for a week; 6. having no car for financial reasons; 7. having no washing machine for financial reasons; 8. having no colour television for financial reasons; 9. having no telephone for financial reasons. People faced with at least 4 of the above 9 problems are categorized as living in severe financial deprivation (based on HCSO methodology).

The question is whether the likes of micro-lending arrangements that have helped many people all over the world, in significantly more uncertain economic circumstances, could work in Hungary and if they could, under what conditions and how effectively. In this paper I explore the possibility of creating economic security in the Buzanian sense of the term (that is, at the individual's level, in addition to the satisfaction of the basic needs of food, drinking water, housing and education, that of employment, income and welfare) (Buzan, 2007: 194.), based on experience accumulated by Kiútprogram Mikrohitel Közvetítő Közhasznú Nonprofit Zrt.[4]. My methods of research included observation and empirical research (questionnaire-based data collection). Empirical surveys were conducted in the autumn of 2014 in three regions of Szabolcs-Szatmár-Bereg county (Szatmár-region with 9 villages, Nagykálló and 7 other nearby villages and Kántorjánosi with 2 neighbouring villages), at the premises of traders purchasing locally produced cucumbers. The questionnaires were filled out by associates and experts of the programme, asking every single individual selling their produce at the given sites during the survey period. The questions related to respondents' personal and household data and characteristics, their relation to *Kiútprogram*, their experience, and results, in producing and selling cucumbers, their plans for the future in general and in terms of economic activities and, finally to their debts and readiness to save money. 244 questionnaires of the total 300 were filled out. A total of 41% of the respondents (100 individuals) were to be regarded as clients because in at least one year between 2012 and 2014 they participated in the programme, while the remaining 51% (144 persons) had not participated in the *Kiútprogram*, so they could be taken as a "control group".

My assumption is that targeted local programmes can help create a certain measure of economic and social security even for social groups living in poverty and exclusion and who are – to use the words of Amartya Sen (2003a; 2003b) – deprived from opportunities. I also contend that these "workless" (Virág, 2014: 46.) people should not necessarily be dependent on society for a living; in suitable circumstances they can even make successful entrepreneurs (in the absence of jobs) and make an active contribution towards improving their situations (H2).

About *"Kiútprogram"*

The programme's objective

Kiútprogram has been launched to help permanently unemployed under-qualified people living in poverty and exclusion (most of them of the Roma population) become self-employed. Self-employment is not a goal in itself, since it is primarily because of the lack of qualifications and working experience that members of the target group cannot realistically expect to find employment in the labour market. For this reason, the programme operates as an intermediary of financial and business support services, and it provides training and advisory services concerning business undertaking and financial subjects, and lifeskills,

[4] The business was launched in 2009 to implement the programme. I also participated in its work, as executive director, and later, distanced to an extent from operational activities, as a member of its BoD. I do hope that by applying scientific methods I will be able to provide a realistic picture of the programme and its achievements despite my involvement in the events.

for (primarily Roma) people living in deep poverty, to enable them to mobilize their own resources and thus improve their poor societal and income positions.

The provision of capital in the form of "inclusive social microcredit" (Molnár, 2012a) is one of the model's pillars. Capital in the form of funding needs to be supplemented by knowledge capital. This is delivered on the one hand by continuous personal support,[5] and on the other hand by technical/professional training and education, and support, integrated in the process. Community building and relationship capital make up the third pillar of the model. "For example the absence of exchanges with others impoverishes human life and at the same time it prevents the utilization of economic opportunities which people can only access with the help of others. In fact, deprivation of opportunities may occur very often together with various aspects of social exclusion." (Sen, 2003b: 13–14.).

Antecedents

The model followed by *Kiútprogram* was one called the Grameen model in operation in Bangladesh, started by a Bangladeshi economist named Muhamed Yunus, who began his first experiments back in 1976, and then established Grameen Bank in 1983. Grameen Bank provides loans for members of the poorest groups of society, with a particular focus on women. The model has been adopted, and adapted to local conditions, by about 100 countries since its inception. The model relies on community building, whereby groups are organized with the participation of people with the aim of helping one another's businesses. Every participant must have a business of his or her own and each of them is responsible for his or her own loan, but group pressure also plays a significant role in the operation of such a community. Field work under the model is focused on community building and management, along with tasks relating to lending/borrowing. I described the model and the process of its adaptation in one of my previous studies (Schütt, 2014).

Functioning, supporting mechanisms and practices

Since its launch the programme has – as befits its experimental nature – undergone a variety of modifications but one thing has remained unchanged. It is still aimed at people living in extreme poverty wishing to join the *Kiútprogram* on a voluntary basis. Both of these circumstances are crucially important.

Between 2010 and 2012 the programme was being run as a pilot programme of the European Commission, with adequate funding (at that time still with contributions from the Hungarian state). After the closure of the 27-month EU project *Kiútprogram* could be continued with donations from private individuals and private businesses committed to the cause. However, its implementation had to be adapted to the existing resources, as a

[5] I prefer to use the expression *social coaching,* (in German: *soziale Betreuung*), because this is the one that comes closest to the complex set of entrepreneurial-social-financial activities applied in Kiútprogram provided by participants "clients" of the programme from the field workers, that is, the programme's employees. Social coaching is more accurate than *mentoring*, primarily because this is based not on a relationship between educator and educated but the provider and the user of a service.

consequence of which the programme has only been present since 2013 in a total of 15-20 towns and villages in the territory of Szabolcs-Szatmár-Bereg county and the micro region of Bodrogköz, in the area of Borsod-Abaúj-Zemplén county. The original concept under which any viable undertaking of the clients – with suitable business plans – would be provided with funding, had to be abandoned. Instead, the programme integrated its clients in an existing intensive commercial cucumber production and marketing chain, primarily on the basis of the positive experiences of the last year of the pilot (2012). This is because in cucumber production farmers can sell their produce during the growing season (June to September) even on a daily basis, generating a continuous flow of income.

As the programme had previously been known in the Central and East European Region, from 2013 on staff members referred to as "field workers" could, rather than disseminating general information on the programme, focus on its rules of operation and on screening the applicants. The purpose of the screening procedure is to select suitable clients meeting the requirements of the programme who wish to become, and, according to the results of the preliminary assessment, are presumably capable of becoming, entrepreneurs and even have some resources for use in the undertaking (e.g. a yard suitable for cucumber production or perhaps some earlier agricultural working experience etc.), and, before all else, belong to the target group (living in income poverty, or perhaps in deep poverty and social exclusion). The latter is determined by the field workers not on the basis of official documents but by way of a thorough examination of the applicant's living conditions and by developing a close acquaintance with the family concerned.

After selection – during the winter months – participants undergo training for becoming entrepreneurs (primary agricultural producers) and for the production of cucumbers. This process usually takes place at the places of the participating families, sometimes for multiple clients at the same time, at least once a week. From early spring on the integrators in charge of the management of production under contracts conclude production contracts with the producers, and with the traders in direct contractual relationship with them, under which the latter purchase the cucumbers harvested each day (sorting the cucumbers by size, measuring the produce and paying the procurement price, subtracting due repayment instalment of supplier loans, if any). At the same time, preparations for production get under way under the direction, guidance and control of the agricultural experts, joining the process, as commissioned in the context of *Kiútprogram* and with the support of the field workers. Such preparations include digging and pest control in the yards, putting in place (replacing, repairing) the support structure required for intensive cucumber production, construction (checking, repairing) of irrigation installations etc. The cucumber seedlings are planted in the plots in late April and in early May, depending on the variety to be grown and the weather conditions. Cucumbers ripen from early and mid-June and producers must work continuously on the fields right until the end of the summer or up to the middle of September. All of the above activities make up a learning process, as the above mentioned agricultural professionals visit the clients as often as necessary (but at least once a week) to discuss the tasks coming on next: when and how to "water" the plants, how to remove some of the foliage, how and what to spray on the plants, what fertilizers to use etc. The bulk of the work, however, is harvesting the produce. The smaller the cucumbers they pick the more the participants get paid, so in many cases they need to go through the entire plot or field more than once a day so that the cucumbers do not "outgrow" the size limits. The

programme's field workers always assist and support the clients during this intensive period; they are present so that they can help them solve other problems as may be necessary. The aim is that the participants earn enough income during the growing season for repaying the amounts borrowed for starting and maintaining production and have some additional income for themselves.

The season ultimately ends upon the settlement of accounts with the clients; all of the stakeholders (producer, purchaser, integrator) evaluate the given year and determine the next steps and tasks.

Participants, roles and instruments

The "cucumber growing Kiútprogram" model, which is a product of several major changes, and which we should refer to as version 3.0, involves multiple participants. The client is the central figure. He or she is the primary agricultural producer that is the individual participating the programme (the family member who does not lose, by participating in the programme, any other allowances, benefits, incomes he or she may have, including public employment, as the case may be). Clients' profiles are characterized – according to the data recorded in the course of the aforementioned questionnaire-based data collection – by the following (*inter alia*).

The majority of the programme's participants belong to the Roma population.[6] According to answers to the question concerning ethnicity Roma people make up 74% of the participants, more than twice the ratio of the same minority among the "non-client" population. According to estimates in background materials underlying reports on the *Kiútprogram* Roma people made up about two thirds of the clients between 2014 and 2016 (based on field workers' subjective impressions, as well as information received from clients or others). Their proportion among the participants of the programme is significantly higher than in the total population (in the 2011 census some 315,000 respondents noted that they belonged to the Roma community, that is, 3.2% of the total population of Hungary).

Low schooling attainment. Some 67% of the respondents have no vocational qualifications at all; they have completed the 8 years of the primary school (or less). The proportion of this social group among non-client respondents is nearly 10 percentage points lower (56%). The proportion of people with primary school education was 26.8% among the total population aged over 15 years, while that of people who never finished primary school was 4.9%[7] according to the 2011 census. "This circumstance [under-education] is probably the single most important factor determining Roma people's employment possibilities as well" (Bernát, 2014: 246.).

Poor housing conditions Some 68% (in the Szatmár region: 70%) of the respondent clients live in family houses in need of refurbishment. Among non-client respondents the corresponding ratio is 59% (national average: 61%[8]). A significant proportion of dwellings

[6] Those considering themselves to be primarily or secondarily Roma.

[7] www.ksh.hu/nepszamlalas/tablak_nepesseg_iskolazottsaga

[8] www.ksh.hu/docs/hun/xftp/idoszaki/pdf/miben_elunk15.pdf

(and houses) belong to the substandard category.[9] The proportion of such units has dropped from 15% in 2003 to 8% in Hungary as a whole, but nearly half of the approx. 320,000 substandard dwellings are to be found in villages. Some 30% of the respondent clients have no running water in their dwellings (national average: 9%).

Low income. 43% of the respondent clients live on HUF 21,000-50,000 a month, that is, they belong to the 2nd income decile according to 2014 HCSO data.[10] 44% of non-clients belong to a higher (HUF 51,000-80,000) income bracket. A similar picture was formed of households as well. The household income of at least 38% of the clients involved in the survey was below the poverty threshold[11] (HUF 49,230)[12] calculated for the given year (2014).

Low employment. Based on the results of the survey respondents fall into two large groups in terms of employment. 36.5% of them are public workers (with non-clients being the majority) and 25.7 of them are unemployed (in which category participants of the programme form the majority). In legal terms public workers also quality as unemployed, i.e. we are talking about a single large block making up 62% of the respondents. 11.2% of the non-client respondents and only 1% of the client respondents work full time.

Accordingly, for the most part, *Kiútprogram* clients live in poverty and social exclusion, primarily as a consequence of low schooling and economic activity. A focus group survey (Vicsek, 2004a) highlighted a mentality, particularly prevalent in the Roma community, that they, as "small people", full of everyday worries and concerns, have no influence on how things are; rather, they are "passively exposed to decisions made by those on higher levels of the hierarchy of society" (Vicsek, 2004a: 296.). The members of the Roma focus group reported of a high degree of insecurity, particularly as regards the future of their children (Vicsek, 2004a: 301.).

Kiútprogram's staff members are field workers, carrying out the tasks of seeking out and providing clients with assistance. This is all the more important because the target group is characterized by a severe lack of assurance and security[13] (Vicsek, 2004b). A good field worker is a sociologist, a social worker, a financial expert, a business advisor and a coach, all in one. A field worker needs to win the confidence of the clients in the programme and his or her own work. Moreover, a field worker has to make efforts to enable clients to learn how to have confidence in themselves and the success of their businesses. Field workers help in the performance of administrative tasks relating to the business undertakings (customer portal registration, communication with the book keeper, taxation). They help clients become increasingly capable of taking care of the administrative formalities on their own, of concluding contracts and performing business activities. The toughest challenges facing field workers lie in community building and development and in helping clients and their families build up, maintain and expand their own network of social relationships.

[9] A flat meeting any of the following criteria qualifies as substandard: no toilet or bathroom, no sewage service available; adobe walls, with no foundation; no running water. Also substandard is a flat if it has no kitchen, if its total area is 50 m² or less, or if it has only one room and that is smaller than 12 m².

[10] Income deciles: the deciles of the population covered by the survey arranged in an order on the basis of the per capita net annual income.

[11] 60% of the median of the equivalent annual income in terms of purchasing power parity (PPP), in EUR and HUF, calculated for single person households and for households of two adults and two children (based on HCSO methodology).

[12] KSH

[13] A negative emotional state resulting from a sense of a lack of assurance (based on Vicsek, 2004a; 2004b).

Residents of a village or town know one another. The perception in the community of a family will in many case change as soon as the neighbours learn that they have joined the *Kiútprogram*, i.e. that they wish to work. It is a successful business, however, that makes a real breakthrough, which takes 3-4 years in the majority of cases, and not everyone can actually make it (less than 10% of those joining the programme quit prematurely). The field workers are professionals with tertiary education, who have received specific training under the *Kiútprogram*, working for a competitive salary. In 2014 and 2015 about half of the programme's operational budget is made up by personal expenses (the bulk of which comprises field workers' pays, contributions and taxes). Other significant expenditure items include the cost reimbursement paid to field workers for the use of their own cars, technical/professional (cropping) training and supervision.

The third participant of the model is the so-called integrator, managing the processes of cucumber production, who is an element of the given production and marketing chain, partly financing production through the purchasing agents, buying and then selling or processing the cucumber produced by the participants. From 2015 as Kiútprogram Zrt. – as an integrator – itself, also undertook to perform business activities in order to be able to control the entire process and to enable customers to earn even more income.

Loans are one of the instruments used in *Kiútprogram*, which in the current version of the programme provided for the clients not in the form of cash but by selling them the asset**(s)** required for production according to the business (production) plan, against delayed payment (commodity loan). Services provided by the field workers, their presence (the technical/professional methodological support for their work), training that is integrated in the process as well as community building and development make up the background services and resources ensuring the programme's region-specific embeddedness and sustainability and, through these, the enhancement of the target group's self-sustenance capability and economic security together, reducing, at the same time, their exposure.

Summary, conclusions

A manual was published in the summer of 2016 on the implementation of local programmes promoting equal opportunities, in the way of the output of the work of a World Bank working group (Bhatt–Mason, 2016). The manual was published specifically for use by local mayors and municipal governments. One of the positive examples, specifically highlighted in the manual, is *Kiútprogram.* The authors' opinion is that the primary reason for this is that this is the only one among the examples showcased in the manual, which is functioning at multiple municipalities simultaneously and which can be reproduced and multiplied.

Hardly any information is available in Europe concerning the instrument of microlending as a business development (self-employment increasing) and poverty mitigating tool. Attempts at introducing and operating a similar scheme have been made in Hungary by the SEED Foundation and the Autonomy Foundation. Little experience of use has been accumulated in neighbouring poverty-stricken countries (BESA Foundation – Albania, Horizonti – Macedonia etc.) too (Reszkető–Váradi, 2012). Indeed, even the existing initiatives focus their attention on businesses operating in the "informal" economy, therefore the processing

of the more than 6 years of experience of *Kiútprogram*, which is operating exclusively in the "formal" economy, is definitely a highly useful – a gap filler – undertaking.

One of the objectives of my questionnaire-based data collection was to form a picture of the income that can be generated by cucumber production by the clients in *Kiútprogram*, and see what contribution this can make to their respective household incomes. (This is a sensitive question which was not answered by all respondents.)

Table 1

Distribution of incomes from growing cucumbers (%)

	Total				**Szatmár region**			
	Last month's net income N = 150		**Average monthly net income N = 163**		**Last month's net income N = 103**		**Average monthly net income N = 101**	
	Client							
	No	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**
Less than HUF 20,000	0	39	4	46	0	14	1	10
HUF 21,000 – 50,000	18	25	13	16	18	17	14	10
HUF 51,000 – 80,000	51	21	50	22	53	45	51	52
HUF 81,000 – 100,000	23	8	21	11	22	10	22	14
HUF 101,000 – 120,000	5	3	9	2	4	7	9	7
HUF 121,000 – 150,000	3	3	4	2	3	7	3	7
More than HUF 151,000	0	1			0	0		
Total	100	100	100	100	100	100	100	100

Source: Own data

According to their answers, more than 60% of the respondent clients earned net monthly incomes from cucumber production below HUF 50,000 a month. By contrast, the monthly incomes generated by over 80% of the non-client respondents – with higher schooling attainments and with more working experience – exceeded HUF 50,000. In the Szatmár region about 50% of the client respondents managed to earn as much as their non-client counterparts (HUF 51,000–80,000). The results show that the incomes from cucumber production made a significant contribution – at least during the growing season – to the family incomes, in both groups of respondents.[14] This is also borne out by data collected in the context of the programme.

[14] By contrast, the total amount of the subsidy substituting employment was HUF 22,800, while that of the monthly net wage of public workers was HUF 51,847 in 2015.

Table 2

Tiered individual net incomes of Kiútprogram clients from cucumber production in 2015

	Total (persons)	**Distribution %**	**Of which: beginners (persons)**	**Of which: non-beginners (persons)**
More than HUF 1,000,000	5	6	0	5
HUF 500,000 – 1,000,000	13	17	2	11
HUF 300,000 – 500,000	16	21	10	6
HUF 150,000 – 300,000	11	14	6	5
HUF 20,000 – 150,000	25	32	23	2
Less than HUF 20,000	8	10	8	0
Total	78	100		

Source: Kiútprogram, BoD Kiútprogram report

The results show that with the help of the resources and methods provided by the programme and by their own effort, participants of *Kiútprogram* are capable of carrying on income generating activity, they can get themselves integrated in a given production and marketing chain, thereby enhancing their economic security (H1). This is also confirmed by the fact that 67% of the respondent clients wish to carry on with cucumber production. Moreover, among the factors considered to be most essential for successful cucumber production the respondent clients mentioned (after the loans they received, and in a nearly equally high proportion) technical/professional assistance (training integrated in the process) and the support received from the field workers.

As a production integrator *Kiútprogram* sold a cucumbers for a total amount of HUF 54 million in 2015 and nearly HUF 66 million in 2016, 80% of which was purchased from its own clients. In this way the community of the programme's participants generated a significant amount – value – and became a dominant factor of production in the given production region. Even people who are regarded by many as being "workless", people living in extreme poverty, who have – for a variety of reasons that cannot be discussed here for constraints of volume – turned their backs on and become alienated from the institution system of the society, are capable, with adequate support (but not direction and control), of successfully operating as primary agricultural producer and actively contributing to making improvements to their situation (H2).

Not all participants of the programme managed to become successful entrepreneurs (even Buzan noted the conflict between economic security and the uncertainties that are caused by an essential element of capitalism, that is, economic competition – Buzan, 2007: 193.), and repaying the loan received. Nonetheless, the programme has presented a positive picture on the whole. By accessing resources made available through the programme participants got integrated and embedded in the local social and economic communities. This in turn, leads to growing economic security and sustainability.

Research must be continued into this programme and similar governmental (e.g. public employment) and non-governmental projects. To this end a standardized set of indicators should be worked out to facilitate evaluation.

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István Kopcsó – Róbert Balázs

New Methods in Disaster Medicine: the Utstein Guidelines and Their Hungarian Application

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Abstract

One of the goals of disaster medicine is the conduct of studies to enable evidence-based learning that will translate into prevention or reduction of the adverse effects of a disaster on human health and the health system infrastructure.

Due to the complexity of the subject and the different opinions of the nations and NGOs on the management procedures of disasters, there is no consensus on the priorities or best practice methodology for disaster evaluation and for conducting studies.

To offer a possible consensus on the standardization of disaster research the Utstein Task Force on Quality Control of Disaster Management was established; an international panel of public health experts and disaster medicine practitioners. The Task Force, which the authors are members of, identifies the priorities and proposes solutions concerning the design and conduct of such studies.

The authors aim to introduce the Utstein guidelines to the Hungarian research of health disaster management and relief planning and to commence the education and training on the subject in order to find the common understanding between the different players.

Keywords: disaster, security, disaster medicine, best practice, Utstein guidelines, qualitative and quantitative analysis, indicators

Introduction

Under specified circumstances, certain types of disasters may pose substantial safety risk for a country, region or even a continent. For example, in particular, man-made disasters including wars, warlike conflicts or nuclear, chemical, biological events. In our opinion, massive (largely illegal) migration as a potential disaster category (Figure 1), which for obvious reasons is not included in the traditional classifications, requires particular care, which,

in the case of insufficient management, may negatively affect even a significant part of the basic social functions of the country (region) generating additional unfavourable processes.

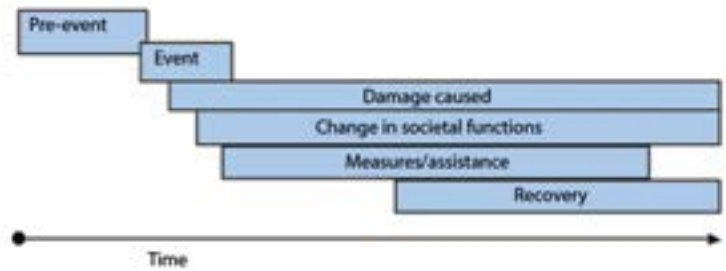

Figure 1

Longitudinal section of disasters

Phases have a chronological order, their length varies, they can overlap or occur simultaneously. Damage and damaged social functions will only be eliminated at the end of recovery.

Source: Scandinavian Journal of Public Health, 2014/42, 27

The challenge

The objective of disaster medicine is to make the research and studies carried out, based on evidence-based medicine, to help prevent disaster-related health damage and reduce harm both at the level of the individuals and healthcare as a system. Due to the extreme complexity of the issue, and the different national positions and also to the different interests of the many international and non-governmental organizations that are dedicated to disaster management issues, there is no broad consensus on health disaster management. Moreover, there is no consensus either on its research methodology, on research priorities of disaster medicine, not even on the *best practices* of disaster medicine.

The methodology

One of the possible solution alternatives to dissolve this situation was the establishment of the Utstein Task Force on Quality Control of Disaster Management (TFQCDM) at the beginning of the 1990s, of which the authors have both been members since 2010. The Task Force multidisciplinary experts from five continents are also members of a research group that meet several times a year, coordinate their activities in the framework of workshops and set guidelines for their research. Their results have been published in a number of studies and books, synthesizing their fieldwork experiences with theoretical considerations.

Based on their own experiences and on the results of other research groups, the members of the Utstein Task Force make recommendations on the further research directions, priorities and methodology of disaster medicine.

The results

The task force developed the Utstein guidelines, which constitutes the scientific basis for a "dual-mode" analysis, i.e. the simultaneous application of quantitative and qualitative methods. The mixed approach expands the spectrum of the research and enables the evidence-based approach of disaster medicine. The conceptual and structural fundamentals of the subject have already been published in two volumes, with the third volume being under preparation. This section presents the questionnaires required for data collection and the methods for evaluating the collected data.

Interpretation

The introduction of the methodology and research directions partially developed by the task force as well as the introduction of indicators to be adopted in the near future will greatly improve the quality of disaster medicine research and the assessment of current disaster management. The methods and techniques proposed by the Task Force are expected to greatly improve data collection and evaluation procedures used to eliminate the health consequences of disasters, and the reliability and reproducibility thereof. Standardized data become available in different databases and libraries, enabling researchers of a given subject to carry out comparative studies concerning the health disaster management of various disasters and the success of interventions.

These comparisons contribute to the evidence-based scientific approach of disaster medicine in Hungary which later can be a reliable basis for an effective disaster relief system combined with an integrated approach. An additional benefit is that medical assistance can be provided in a personalized way with maximum impact, at the same time in a cost-effective way.

Methodological framework for disaster research

The determination of methodological framework of disaster research on the basis of consensus is required and essential to be able to investigate using scientific methodology. Disaster reports and case reports most often report on event from a different point of view, mixing or swapping concepts. The disaster, the situation created by the disaster, and the remedial events are not broken down into phases, therefore comparing of the reports is not simple or even impossible.

The methodological framework outlined in the study clarifies the concepts (hazard, risk, vulnerability, social preparedness, etc.) and provides a solution for longitudinal-sectional and cross-sectional analysis of the disaster evolution and eradication process of a particular hazard.

Phases of disasters

Longitudinal framework

The longitudinal-sectional framework divides disaster evolution into phases in a chronological order. The definition of each phase is determined by their attributes and not by time units, so the phases can flexibly follow the different time intervals of the different disasters.

These phases in the longitudinal framework are the following:

1. the period immediately before the event,
2. the event that causes the disaster to occur,
3. the damage caused,
4. change in basic social functions,
5. measures/assistance,
6. recovery.

The longitudinal-sectional framework (Figure 1) can be applied for every disaster. The duration of each phase will be of different length according to the evolution of the disaster. For example, in case of a drought, the event phase lasts for several months, and damage occurs afterwards, while a rise in the river water level causes floods relatively quickly, but there are still days available for preparation. A tsunami, however, changes rapidly, in minutes, from the event phase to the damage phase, if the wave hits a populated area.

Cross-sectional (trans-sectional) frame

In disaster research, the cross-sectional frame investigates events and changes occurring at a time in the light of the status change in basic social functions.

Basic social functions are as follows:

1. medical care/healthcare,
2. public health,
3. drinking water and sanitation services,
4. food supply and communal catering,
5. energy supply,
6. logistics and transportation,
7. public security,
8. public education,
9. social systems,
10. housing and clothing,
11. communication,
12. economy,
13. public spaces and infrastructure.

With the introduction of longitudinal-sectional and cross-sectional frames, the research methods of disasters became integrated, therefore the research materials became comparable (Figure 2). So the method works not only for assessing a particular disaster, but also when

we need to compare the damage caused by the same type of disasters (e.g. earthquake) or different types of events (earthquake and hurricane).

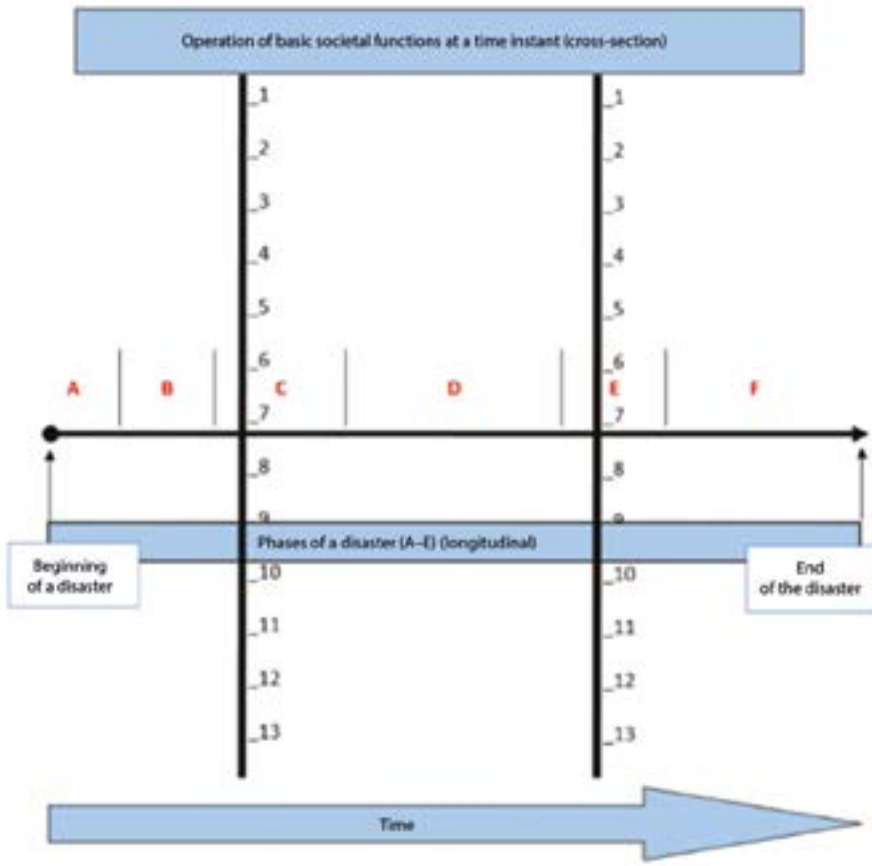

Figure 2

Longitudinal- and cross-section of disaster evolution

Source: Scandinavian Journal of Public Health, 2014/42., 19.

For basic societal functions, in order to carry out the assessment it is necessary to have indicators that are partly available, others have been developed by the Utstein Task Force and will be made available in the near future in a publication. Certain basic societal functions have additional sub-functions that can be divided into different elements or sub-elements.

In addition, it is worth mentioning that the *Sphere Project*, managed by some non-governmental organizations and international relief organizations (Doctors Without Borders, Red Cross, etc.) has some indicators that are already being measured and used during disaster relief. The use of these variables already greatly facilitates the development and application of minimum standards for humanitarian operations and enables our task force to measure and evaluate basic societal functions in each disaster phase.

Operational considerations

One type of scientific research methods is the intervention method when the effects of some form of intervention is examined in the case of the observed system. The second type is represented by epidemiological research when a non-intervention method is used: research does not interfere with the system, it only observes and describes it. In disaster medicine both methods are used during the operational execution and both methods begin with data collection.

With a properly selected and consensual data set, the cross-sectional assessment of basic societal functions provides a snapshot of the process of disaster evolution. The operational framework helps to record the values of the studied basic societal function variables, and also the disaster assistance can be customized using the information obtained.

The additional elements of the process are the following:

1. evaluation,
2. needs assessment,
3. preparation of the intervention strategy,
4. selection of the type of intervention,
5. preparation of the implementation/operational plan,
6. implementation of the selected interventions,
7. analysis and evaluation of impacts.

The operational framework provides an evidence-based scientific approach to disaster research and enables a standardized assessment of disasters.

Feasibility in Hungary – the use of the Utstein guidelines in Hungary

The above mentioned characteristics of disasters and disaster medicine – the lack of an integrated approach and methodology between different schools, organizations and countries, including definitions, structured and objective data collection, the indicators used, the analytical and evaluation methodology, and research and development directions – in our opinion, are also valid for the situation in Hungary. In addition, it is also true that certain organizational elements are already being used to develop and educate the science of disaster medicine, especially in universities and scientific societies.

We are talking about disaster medicine, a new and emerging discipline whose importance is felt by everyone, but there are still no scientific cornerstones and methodologies adopted by broad international consensus – these are currently under development. Due to the diversity of actors and in many cases their radically different interests, this task does not seem simple and will certainly be a time-consuming process. In our opinion, the Utstein method, if adapted accordingly, is an excellent way to provide the theoretical bases and direction for Hungarian disaster medicine research, and can be an excellent basis for creating a national consensus to initiate the development of cooperation opportunities among practitioners of the profession. Regarding the size of the research ambition, we believe that this consensual approach can provide sufficient work and responsibility to all disaster management and disaster medicine organizations and research workshops in Hungary.

Our idea is to introduce the Utstein method in Hungary in several stages. As a first step, the key players in the country will learn the essence of the method and the exact schedule and roles will be developed. Subsequently – or rather in parallel – the participants would develop the syllabus for the teaching method, applying the principle of *train the trainer* which is commonly used in the field of military medicine.

Using the primary experience, they would later accredit training on both national and international (NATO) level with the involvement of the NATO Centre of Excellence for Military Medicine (MILMED CoE) and could be part of the national university graduate and postgraduate training, and through MILMED CoE it would be included in the circulatory system of international military medicine. In addition to the above, adapted and accredited accordingly, the method could be a part of the national defence, disaster management and law enforcement specialized medical training curriculum, we hope, helping to mitigate the chronic shortage of specialists of the area.

In the longer term, if the appropriate team of experts is available, as a member of the Utstein Group, the appropriate international coordination and cooperation opportunity for our specialists would be granted, and Hungarian disaster medicine would soon be able to join the mainstream of international research and cooperation. Based on the authors' international experience, it is possible for Hungary to be able to serve even as a regional leader if we have the corresponding ambition and will, and the necessary set of conditions.

The authors are withholding the more detailed and comprehensive discussion of disaster medicine applying the Utstein method for their subsequent publications. Only the authors working in the task force are entitled to publish the results of the Utstein Task Force on Quality Control of Disaster Management.

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Péter Takács

Privacy and Data Security Challenges in the Hungarian Health Sector at the Beginning of the 21st Century

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Abstract

Nowadays information is one of the most important parts of our world, therefore its protection is necessary and indispensable. This protection is especially important if life or health data are concerned. This paper describes the protection of healthcare data in three main sections. The first part refines the concept of privacy and data protection. This section describes the concept of e-health systems and the planned Hungarian Electronic Health Care Service Space. In the second part the question of data security is discussed from the aspects of the latest information developments. The first two subsections of the third part takes a wider approach. The changes will only be successful if the data protection regulations comply with the European Union General Data Protection Regulations and data protection becomes more widespread in Hungary among the developers, operators and users. The third section points out that data protection and data security have not only strict legal and technical limits but the overall medical (demographic, epidemiological), economical and social points of view is also important.

Keywords: data security, privacy, health, information technology, e-health, trends, Electronic Medical Service Space (EESzT)

Introduction

This study focuses on two issues. The first is a discussion of the situation of healthcare data protection in Hungary these days. Based on the first one, the second issue elaborates on what information technology-related challenges await healthcare in the nearest future, and what consequences these challenges may entail in regard to data protection. The overview also aims to draw the attention to a few development trends that have a good chance of producing an impact on healthcare in the short and long run.

Summary

On the one hand, *data protection* (F. Ható, 2005; Nemetz–Vajda, 1991) includes the right to protect personal data, on the other hand, however, the regulations also need to ensure that information about public affairs remains public. A good basis for understanding the origins and evolution of the fundamental principles is provided by the generational classification (Jóri, 2009) which argues that the General Data Protection Regulation (GDPR) adopted by the European Union in 2016 (95/46/EC; GDPR, 2016) is the third generation of the directives and regulations that form the framework of the EU and Hungarian legislation. The members states of the European Union are obliged to implement the regulation from 25th May 2018, which requires a number of interpretative rules and implementing regulations at member state level.

Hungary has completed a number of preparatory steps towards modernizing healthcare. The Electronic Medical Service Space (EESzT), which links the tiers of the supply system and the background institutions, was developed as part of this effort. Currently, the system is in its pilot phase with the involvement of several institutions. But from the fall of 2017, it is mandatory for every healthcare service provider funded from the state budget to use the EESZT (Tarcza et al., 2016). In this context, one of the greatest challenges that e-health system is facing is the adoption and enforcement of legislation that complies with the data protection directives and the GDPR in the member states, which is an important task for Hungary too.

Development of information system similar to the EESZT can be divided into phases in time (Detrekői–Szabó, 2002). The key areas of work in the registration phase are data collection, data processing (creation, management, deletion), sorting and search, organization, etc. In the analysis phase, analysis procedures built on the stored data are developed in order to address complex issues. The third phase is when the system has reached a point in its development where it is capable of simulating effects of future events, thereby facilitating the impact assessment of strategic decisions. Regarding the development phases, it is an important observation that the average time needed to complete the individual phases is 3 to 5 years, but none of the phases can be skipped.

The concept of *data security* (F. Ható, 2005) covers the technical, organizational and algorithmic solutions that are suitable for achieving compliance with legal and non-legal requirements (customs, best practices) for data processing.

Forecasting future conditions requires a profound understanding of the past and the present. Today the Internet is in the era of web 2.0 (O'Reilly, 2009), but we are about to enter the age of semantic web applications (Tóth, 2010).[1] These days we are already witnessing the technical progress that upgrades the objects of the human environment with devices enabling electronic connectivity, which are capable of communicating with each other and with other networks (Internet of Things) (daCosta, 2014; Simon, 2014). Computers becoming increasingly powerful, along with a further increase in processing power will continue to refine the level of detail offered in virtual worlds, enhancing their similarity to the real world.

[1] See also: www.sramanamitra.com/2007/02/14/web-30-4c-p-vs/; www.exkss.com/devel/huHU/onto/showtopic?topicName=Szemantikus%20web.

A possible categorization of the development efforts in healthcare distinguishes the areas of wearable tools, biosensors; extended reality; 3D printing; robotics; micro and nanotechnology; personalized medicine; gene technology; artificial intelligence, and machine learning (Meskó, 2014).

The above development activities can be summarized as follows:

- there are already a lot of health related examinations that used to be limited to laboratories but now can be carried out at home;
- 24-hour monitoring of patients, extended storage and evaluation of data, and alerting if necessary is on the way to becoming a common practice (it is possible that the visible symptoms of a given medical occurrence have not yet manifested themselves, but measurable parameters already foreshadow their imminent onset);
- patients may store the results of measurements taken with instruments, or forward them immediately to their therapists;
- devices are not only capable of performing measurements, but they can also carry out certain automated interventions;
- it is a general trend that items we use every day are upgraded with additional electronic digital functionality;
- an important area of application of these devices is helping injured, disadvantaged and/or elderly people;
- devices of Augmented Reality (AR) can bring the benefits of digital technology to many areas of our daily lives;
- 3D printing of artificial limbs and protheses is already possible today;
- there are ongoing experiments to replace human organs and tissues with 3D technology;
- *tissue engineering* has been introduced as a new bio-engineering discipline;
- researchers experiment with shape-shifting structures similar to those found in nature;
- robotics can bypass physical limitations of human beings;
- replacing and controlling injured limbs produce increasingly sophisticated solutions;
- these days focus in healthcare, nursing and social care is shifting towards solutions offered by robot technology;
- micro and nanotechnological applications are playing an increasingly important role in many areas of our lives;
- combination of communication technologies with these materials technologies will be certainly one of the trend-setting areas of the future;
- achievements of infocommunication technology, the underlying network support, and machine intelligence already have an impact on our immediate neighbourhood;
- in healthcare computer applications supporting prevention, diagnostics, healing and rehabilitation have been introduced;
- artificial intelligence proved to be more efficient in many areas than humans.

These new devices and infocommunication applications must comply with the requirements of operation as well as the data security requirements of operability, reliability, availability, accessibility, integrity, authenticity, irrefutability, and confidentiality (Folláth et al., 2010).

The devices and applications are often based on the latest achievements in research and development. Development is a competition, those who respond faster and offer the

less expensive solutions will earn greater profits. Data security often seems to be an expensive and unnecessarily resource-intensive component of a project. In the recent years data security considerations were omitted from development plans in many cases. As regards projects relevant to healthcare, an even more stricter approach is required, and professionals and developers are already aware of this fact, and maybe users have also realized it. Data protection seems to be "waking up" from its slumber: the third-generation General Data Protection Regulation (GDPR, 2016) of the European Union already addresses the issues of built-in data protection (*Privacy by design* – Data protection oriented attitude should infuse development, starting from the design phase). Actual implementation of built-in data protection will surely slow down technical development and make it more costly, but without applying the principle, solutions with patched-on security additions will be much more vulnerable.

Society moving (or dragged) into the future

In order to present a more comprehensive view, the subject of data protection and data security should be placed in a broader context of relationships. In addition to legal and technical boundaries, there are overarching healthcare (demographic, epidemiological) and social considerations that must be highlighted in regard to data protection and data security in healthcare (Iván, 2002).

When addressing development efforts, system roll-outs, and operation, decision makers will have to take the following into account:

- the population of our country is aging;
- the population is shrinking;
- the number of marriages is in decline, a considerable percentage of the marriages end up in divorce, the number of families is decreasing, more and more people live in much looser family relationships or alone;
- isolation of the individuals with its symptoms and implications leaves its mark on our society;
- the number of children is decreasing;
- differences appear between regions within Hungary;
- our country has to withstand external pressures owing to migration;
- conflicts (ethnic, religious, economic, etc.) between the minority and majority tiers of the society are rising.

Usually, as people in a generation/age group grow older,

- the proportion of women increases;
- male mortality rises compared to the mortality of women (which also leads to an increase in the number of people living alone);
- the number of women suffering from chronic diseases is increasing;
- the degree of the individual's vulnerability to deprivation is increasing (family relationships are shrinking, the supporting network of the family is becoming weaker, there is a measurable decline in maintaining contact with the outside world, etc.);
- widening gaps appear between classes and groups in the society;

- in regard to health and quality of life, the deviation of chances is increasing (increasing differences) and the risk of certain diseases rises, following a natural trend.

The support system should be prepared for the following:

- qualified (medical and healthcare) workforce will be subject to a strong pressure due to migration (salaries, European and American "brain drain");
- some of the most advanced equipment and procedures cannot be financed due to the limitations of the current social security practices;
- medical practitioners age along with the society;
- healthcare workers also age like the rest of the society;
- due to educational, financial or other reasons, a part of the society is still excluded from the services of the digital age.

Summary

In data protection, the Hungarian regulations adhere in part to the data protection trends of the European Union. In many cases the General Data Protection Regulation that is to be implemented compulsorily before 2018 leaves working out the details to the member states. In this regard, legislation in Hungary should involve reviewing and synchronizing the existing laws, directives, regulations and sectoral instructions. Once this process is complete, the lowest tier of regulations may rework the currently applicable set of rules. Implementing the principles laid down in the GDPR in a suitable manner (e.g. data portability, transparency, etc.) may contribute to accomplishing the key information technology related objectives of public administration and healthcare policy.

In regard to data security, we can state that there are fundamental deficiencies in almost all of the examples that we examined. The technological transition (EESZT) that the Hungarian healthcare IT aims to accomplish – which essentially means leveraging the opportunities afforded by the advanced information technology networks – should be open to integrating new elements offering an appropriate level of security in the field of healthcare professions, but also on the patient's end. Infocommunication devices owned by users can be regarded as a significant resource, which, if leveraged after achieving a suitable security level, could lead to economic savings. The transition in this case could be successful if there is also a change in regard to the level of data security. On the one hand, this means using the proper devices, and on the other hand, enforcing operating and data security principles locally.

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Réka Viktória Német

Faces of security – digital wallets

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Abstract

This paper is based on my research *(Intaglio)* at the Moholy-Nagy University of Arts and Design, Multimedia-Art Doctoral School. There are two important segments: money (i.e. banknotes) and portraits. Both their transition and their virtualization are playing an important role in our days. The portraits on banknotes serve a security function but also have artistic value. My research is primarily based on previous work experience I gained in security printing being part of a team to develop a vector-based digital drawing software and the effects of the first Banknote Designer Summit (by the IBDA International Banknote Designers Association 2011, Budapest). The conference mainly focused on digitizing the steps of banknote production to decrease time and speed up the banknote designing part with the help of new technologies. The two main subjects of my research are money and art. Their relationship concerning the bonds of tradition and technology development will be examined. The aim of my research is to present the relationship between art (design) and the latest cutting-edge technology and particularly its future development with its extraordinary implications for everyday life. At the beginning I am dealing with the history of money, the trust in money and the authenticity of money to reveal this relationship. This evolution also leads to the process of digitization which involves the necessity of security preparations against trust abuse, forgery, or nowadays more frequently against hacking. I am going to present the final results of the research in a documentary film.

Keywords: face, portrait, fingerprint, security, trust, digital, analogue, technology, biometrics, object, notion, time, science, art, design

Introduction

There is a thing we can exchange for literally anything, a means everyone is looking to get from day to day, an invention or technology that we have been using in various, constantly changing forms for centuries. It is called money. We accept it, we trust its value and authenticity. The motto on the US dollar – *"In God we trust"* – refers to this fact and not to religion. However, today our faith in money is slowly transformed into a belief in ourselves.

There can be several aspects to recognizing and understanding this transition. In this essay I am presenting the trust in money, with the highlight of the facial portrait.

I wish to share my observations, conclusions with my readers relating to portraits originating from my doctoral research project entitled *Intaglio* conducted at Moholy-Nagy University of Art and Design in the subject of the artistic aspects and digitalization of money. I intend to provoke thoughts indirectly regarding the process of the digitalization of money, the prospects of counterfeiting, the future, and the related negative and positive effects. To that end I feel it is necessary to clarify a fundamental concept the meaning of which is currently undergoing profound changes that are worth following. These variants mostly appear in different shades of meaning, differences, and similarities.

Few people know the term *intaglio* even though we all encounter it and use it every day. It used to be the most important and most secure anti-counterfeiting feature on banknotes. When printed, the dense lines create a surface that produces a tactile sensation. It is also called gravure printing, and on banknotes this technology is mostly used to depict portraits, landscapes and other non-recurring image elements. Before photography was invented, it had been used to print illustrations in newspapers. According to Bruno Cerboni Baiardi, a senior professor at the Intaglio Engraver Academy in Italy, it was a common practice that, for example, if a painting was to be presented to an emperor and the painting was in another country and could not be transported, then an intaglio reproduction was delivered. In the renaissance era, Raphael was a pioneer in the use of engravings. It was his favoured method of publishing his pictures. In its period, intaglio was an invention comparable to the Internet and file transfer today. However, when producing banknotes, it took the intaglio engraver many months to create the image.

In an interview with Dr. Béla Egyed, former managing director of the Hungarian Banknote Printing Company, I asked him about the artistic aspects of banknotes and he specifically emphasized the role of intaglio engraving and portraits: "*Facial expressions and mimicry are a distinct genre in the fine arts. For humans it is the easiest to recognize other humans. Intaglio can reproduce even the finest lines. Line depth lends the image a third dimension*" (Német, 2016: 6.).

Figure 1

Part of an intaglio portrait, a work in progress by the engraver of the Austrian Central Bank, Thomas Schmidt

Source: Author's own photo

In order to reduce costs and to streamline the process, intaglio engravings can be produced digitally today, thanks to software development. Throughout history, adoption of all currencies, including banknotes, took time, but these days even this statement is becoming obsolete. As our ways of life is changing, intaglio is also becoming digitalized and mobilised.

Digitalization – thoughts about the transition

Contrary to its digital version, a banknote is an experience in its own right due to the direct tactile sensation. However, the quality and sustainability of its existence today are facing an uncertain future. In reality, regardless of whether we are aware of it or not, we are witnessing the process in which the material currency is transformed into a virtual concept. Using virtual money saves time and money compared to its precursors. The legendary saying of the former US president, Benjamin Franklin, whose intaglio portrait is on the 100-dollar note, befits the situation: *"Time is Money."*

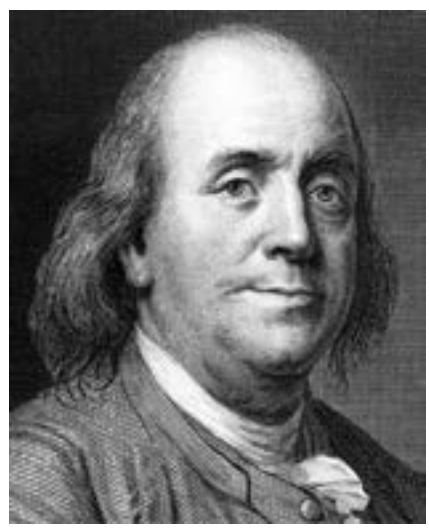

Figure 2

Source: https://en.wikipedia.org/wiki/United_States_one_hundred-dollar_bill (2016. 06. 30.)

Line structures, biometric scanning

The texture of human skin, the fingerprint lines are comparable to intaglio lines in terms of security. These structures are security essentials. Software developers studying digital intaglio drawings attempted to eliminate the artists from the creative process. Similar attempts have already been made in regard to the imagery itself. Portraits have started to disappear from banknotes, a feature, once regarded as the most important security element, which is also a work of art. Would the next step be the end of the banknote? The tracing of intaglio, the artistic portraits based on the recognizability of a face can be translated even

to our modern lives. Instead of portraits of famous people, we could use our own selfies as biometric identifiers, even in financial transactions.

Innovation and digitalization affect not only money, but all industries and technologies (photography, books, cars, pharmaceutical industry, etc.), and even the humans themselves who keep developing these technologies, and focus on the individual. This means that today the portraits of emperors and leaders on coins and banknotes are no longer important. We care more about our own image. Selfishness is spreading and so is the selfie craze. Portraits or faces continue to play a key role in the secure identification of a person, but the process is a bit different. If this is really the way forward, our security will depend on the protection of our own biometric structures, and not on the security design of banknotes. In this way, our wealth and our data will be embodied in ourselves, we will become their carriers. Mobile payments represent a kind of transition as mobile phones are already an integral part of our daily lives, but temporarily tattooed chips also point in this direction. Today, biometric scanning is "advertised" and popularized as a means of increasing our security by a number of companies. Fingerprint scanning and facial recognition programs as well as their digitalized combinations lead us into an algorithmic virtual reality. It is worth considering the dangers this process entails. Criminals have a colourful imagination. The concept of a *counterfeit person* sounds both interesting and has a sci-fi vibe to it as long as you do not experience it yourself.

Figure 3

a) Fingerprint points, b) facial points, c) fingerprint and facial points

Source: The author's own contribution

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József Orbán

Bayesian Networks in Law Enforcement

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Abstract

The contemporary challenges of migration, the terrorists hidden in migrating herds, the accelerated mobility, the info-communication and the sophisticated methods used by criminals, the increasing number of criminal cases are pressing for the study and development of new forensic approaches. One kind of interdisciplinary forensic methodology, the evaluation of probabilistic crime evidences, is in the focus of the paper. It leads on from starting the simple subjective probability approach through the composition of the set of evidences till the action oriented dynamic applications.

Presenting a suggestion for the standardisation of probabilistic scales will improve the proper grounding of judgements and through this the legal security. The scaled application of the Bayesian Networks wherein the joint use of probability and graph theory suggest a new possibility to the forensic scientist and practitioners. The solution may be used as an effective tool in case of difficult criminal cases where instant decision is required. The scaled possibilities may have a place in evidence analysis, investigation and in case of series of crimes in predictive estimations. Its application can be reasonable from the extraction of eroding and fading characteristic features of evidences up to the estimation of original condition of cross contaminated exhibits. A further improvement of the method is the application of the Dynamic Bayesian Network. This provides a possibility to intervene directly in the flow of the daily rhythm of law enforcement. The closing section of the paper provides some examples for demonstration purposes.

Keywords: forensic science, criminology, likelihood ratio, probabilistic scales, Bayesian Network, Dynamic Bayesian Network, surveillance theory

Introduction

In addition to conventional crimes, migration and terrorism pose new kinds of challenges to professionals who are responsible for criminal investigations and national defence. The skyrocketing increase in the number of tragic incidents demands speeding up the development

of methodologies and having a broader perspective on these issues. One of these options is adopting probability based thinking and using it in a much broader scope of applications. Dynamic interventions may offer a suboptimal solution to preventing terrorist attacks and mitigating their escalation. From the detection of a criminal act through the entire process of penal proceedings – including the circumstances of penal measures and the drawing of summarized conclusions – to crime prevention, the application of Bayesian subjective probability is entirely warranted. The study uses this systematic approach to examine the application of Bayesian Networks in criminal cases, from forensic science to criminology.

Role of probability in crime – Overview

Between acts in a penal procedure there may be a "cause and effect, condition and expectedness, precedent and consequence" relationship (Herke et al., 2014). All three pairs of concepts carry the assumption of probability. Uncovering the threads of a crime can be linked to a single actual event, and thus application of the Bayesian probability can be reasonable.

Is it possible to deduce an antecedent from a consequence with any degree of certainty if the witness reports lack veracity or if belief in evidence is not strong enough? "Belief" as used in mathematics and game theory refers to a situation where not all the information required for decision making is available but it does not affect the decision (Hirshleifer-Riley, 1998: 25–61.). With some supplementary social philosophical additions, it may even provide a solution for the judicial legal dilemma (Popper, 1997: 145.). A response from an expert witness that suggests uncertainty transfers the responsibility of decision making to the judge who may not have the knowledge that would be necessary to decide on a professional subject. The negative perception of expert witnesses is clearly demonstrated by the following cynical quote that describes the grades of mendacity: "liars, damned liars, and expert witnesses" (Meier, 2008: 4–19.).

Probability, in its criminological sense, is the strength of a fact-finder's belief in the occurrence of a specific event (Taroni et al., 2006: 1.). Reasonable suspicion is not based on evidence but on presumption the strength of which can be visualized by probabilistic scales. The concept of likelihood ratio quantifies the ratio of probabilities of pro and contra arguments based on known evidence. Bayesian Networks provide guidance to decisions based on systemic approaches through correlations between independent but interacting probabilistic pieces of evidence and events.

Areas of applications of Bayesian probability in criminal proceedings

A number of Hungarian criminal experts already published basic studies in the areas of legal application of subjective probability and Bayesian analysis (Katona, 1965; 1990; Király, 1972: 260; Kertész, 1972). In several works that was either co-authored or based on a shared source of inspiration, Tremmel and Fenyvesi drew the attention to the application of the Bayesian method in forensic science (Tremmel, 2006; Tremmel–Fenyvesi, 2005: 80–82.; Fenyvesi, 2014: 140.). Tóth refers to the early stages of the adoption of the "network model" in regard to indirect evidence used in criminal proceedings (Belovics–Tóth, 2015:

131.). It can be proven that beyond criminal proceedings the theory can be put to good use in implementing decisions and in crime prevention plans.

Applications in the law of criminal procedure

Exploration of facts
When information about acts are received, the probability that a criminal act has been committed is evaluated. The answer "yes" in this case refers not to the certainty of learning about the committed crime but about the probability that warrants the decision. This need for decision making arises again during the survey of the scene and investigation. The amount of data and information to be collected is determined by capabilities and organizational policies. It is becoming clear, however, that the rapid and efficient processing of data and evidence produced in huge volumes can be implemented on a probabilistic basis, using big data techniques (Bőgel, 2015).

Demonstration
In producing evidence the prosecution may evaluate data and information that are either indirect or carry some degree of uncertainty, and may use them as appropriate considering their relevance and weight. The prosecutor's expert determines the degree of uncertainties to prove that the strength of the probability values related to pieces of condemning evidence satisfies the expectations related to facts, and therefore they are admissible in court. Defence may assess the validity of probabilistic evaluation of information from a different point of view. It may explore the weak points of the conclusions drawn using the probabilistic network so be re-evaluating connections and furthermore by creating a new connection network (or using different probability values) the admissibility of the persecution's data can be refuted.

Sentence and reasons
A network system filled with information and facts produced in the preparatory phase of a trial could be used to direct the judge's attention to the dubious aspects of the case. Using a Bayesian Network before sentencing can provide an aid with which it is possible to evaluate if all data, arguments, facts, testimonies and depositions will be taken into account with a necessary and sufficient weight in the objective sentence. It is entirely possible that preventing even a single instance of miscarriage of justice would offset the expense of introducing the system. Adopting the concept of probabilistic evidence poses the greatest challenge in the courtroom (Muller, 2012) as demonstrated by a number of examples that are independent of legal systems and cultures. There were even opinions[1] that went so far as to declare the use of the Bayes' theorem a heresy.[2] The scientific world responded with outrage to these views, and a number of opinion pieces were published that harshly condemned them.

[1] See: www.maths.lancs.ac.uk/~lucy/publications/position-statement-01-2011.pdf
[2] It should be mentioned here that the appeals court of the United Kingdom believed the use of the Bayesian theorem was suitable to interfere with common sense.

Following the judgment in RvT, 36 forensic experts of ENFSI[3] released an open letter in which they explained their position in regard to the anti-science stance of the appeals court.

Use of Bayesian methods in penal practice

In cases of minor offences or where the risk of repeat offence is improbable, using a Bayesian Network to evaluate the circumstances can assist in determining to what extent house arrest would increase the risk of repeat offence or of committing any other crimes in regard to the given convict. It would benefit the internal order and security of penal institutions if convicts assigned to the same call were selected after a preliminary evaluation of the convicts' behaviour and past, thereby reducing the number and the severity of internal incidents. A study conducted in the State of Utah revealed that future loads of penal institutions can be forecasted by creating suitable Bayesian models (Blattenberger et al., 2010).

Bayes and prevention of crime – subjective probability in criminology

Using a Bayesian Network it is possible to identify areas where criminological observations and the associated probability values can be taken into account. Based on follow-up analyses, using the year of 2006 as basis until 2010, the results showed a declining trend in regard to the number of violent crimes in Memphis, which was more favourable by almost 10% than the average crime rate in the United States (Vlahos, 2012). An excellent example of an interdisciplinary search for solution is the *Blue CRUSH (Criminal Reduction Using Statistical History)* system implemented as part of a cooperative effort between IBM and the city of Memphis. It combines collection and processing of a huge amount of criminal statistical data, and uses the trends to calculate probably crime hot spots (Strickland, 2014). Using a surveillance theory model, input was based on deductions made from information provided by signal transmitters attached to the arms of repeat offenders (Orbán, 2016) and cameras, sound samples captured by acoustic sensors and audio spectrum data suggesting the use of a firearm, which are then employed to identify current hot spots. Prevention of crime can be a factor in city development plans or at the time of renovating city districts. Criminological analyses of the city of Bangkok also indicate potential uses in crime prevention (Boondao, 2008).

Forensic and mathematical approach to Bayesian methods

Scientific reasoning and, in particular, finding proof based on mathematical and probability calculations, uses a language that differs from that which is used and expected in the courtroom (Sallavici, 2014: 188.). Judges are only required to know mathematics, decision theory, Boolean algebra, game theory and probability calculus so as to understand and take into consideration the reasoning of the forensic expert. On the way to the solution – i.e.

[3] European Network of Forensic Institutes.

the use of scientific and forensic evidence in the courtroom – the recommendations in the McClure report are worthy of consideration. The committee judges soft and hard evidence based on scientific support. In regard to the first case it recognizes the importance of scientific validation. In terms of science, the committee considers the use of control groups and the prioritization of methods based on validity (scientific error) and reliability (human error) justified (McClure, 2007: 12.). The 9 recommendations made in regard to the forensic experts include promotion of communication between the disciplines involved and the provision of statistical information usable by judges. From the long list of recommendations made to the judges, I would highlight those relating to further education and the status of judicial scientific advisor (McClure, 2007: 12–16.). These two points are particularly important in terms of the correct interpretation of probabilistic evidence and in order to prevent unwarranted exclusion of evidence that is not understood. According to Evett, forensic reports should satisfy four conditions (balance, logic, transparency and robustness).

Bayesian Networks based on the Bayes' theorem and graph theory offer several sophisticated options to forensic scientists. Taroni and Garbolino summed up these options in four points, each of which is related to the acquisition of a certain skill (Taroni–Garbolino, 2001). The four groups: mentality needed for handling uncertain information, the ability to use these methods, capacity to act rationally in an uncertain environment, and the use of data for model building. Expert systems built on the use of Bayesian Networks are categorized as *Probabilistic Expert Systems* (PES) in the English literature (Dawid et al., 2002). These methods are given a special emphasis when the most probable one needs to be selected out of competing hypotheses, and the choice must be underpinned by scientifically sound reasoning.

The advantages of Bayesian Networks appear most markedly in complex multi-variable areas. Such areas include transferred DNA samples or the mixing of DNA samples with human and animal-derived residual materials (Halverson–Basten, 2005). The above parts examined the investigation of some constant, statically stable forensic problem. Law enforcement requires intervening in the course of actions. In such a case, resolving static methods after the act is not productive. Integrated into the processes and adapting to their pace, Dynamic Bayesian Networks appear to be the most suitable. Inclusion of surveillance theory allows for making and updating decisions in response to momentary changes. An example: when an arrest is to be made and the target person's position is known, the records of their past movements can be used to predict the route they will follow in the future so that the place of arrest may be planned.

Demonstration of Bayesian cases in forensic science

Out of the Bayesian methods, we will use methodologies involving Bayesian Networks and Bayesian statistics to investigate a fictitious crime scenario. (This serves as a simple demonstration of utility.) According to the fictitious scenario, a notebook containing sensitive data has been stolen from the boot of a car left in a parking lot in Veszprém. Based on a description, HJ[4], who has a criminal record, can be accused of committing the crime. His be-

[4] HJ: Initials of the fictitious perpetrator.

haviour is known and his criminal career is characterized mostly by casual theft and casual breaking and entering. His area of movement and the distribution of his locations in time: Tata (50%); Budapest (25%); Székesfehérvár (15%); Veszprém (7,5%); Győr (2,5%).[5] He sells stolen items as soon as possible to fences in major cities within his area of movement. He exhibits law-abiding conduct at the place of his permanent residence and in the period preceding the crime in our example theft, breaking and entering or fencing of stolen items were not detected. His intelligence is below the average, he does not like or use computers.

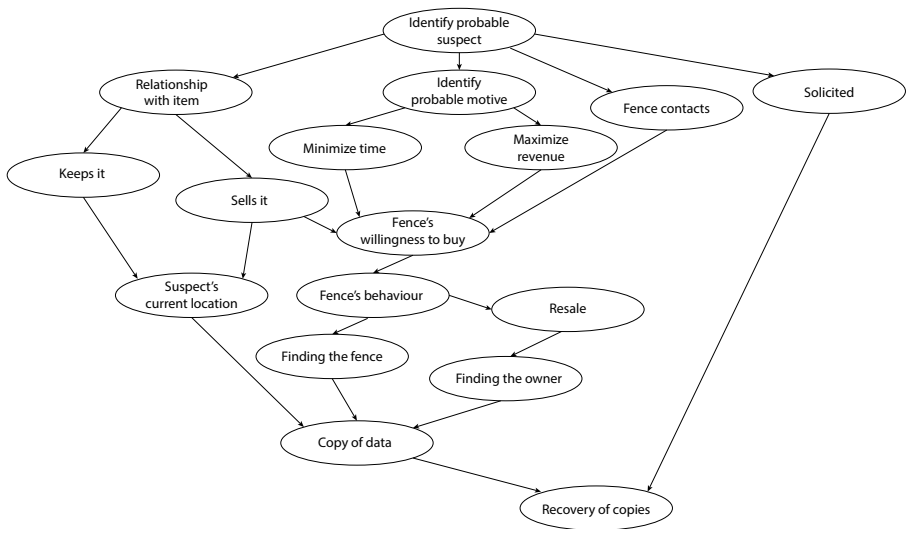

Figure 1
Example of a model using a Bayesian network

Source: Author's own work

The objective can be the arrest of the perpetrator and/or the recovery of the stolen items. In order to prevent the leak of the aforesaid sensitive data, the operation should be concluded as quickly as possible, and any copies of the data that might have been made should be seized (Figure 1).

[5] The presented order of the locations is fictitious, it is not based on forensic statistics, and it is only used to improve our demonstration.

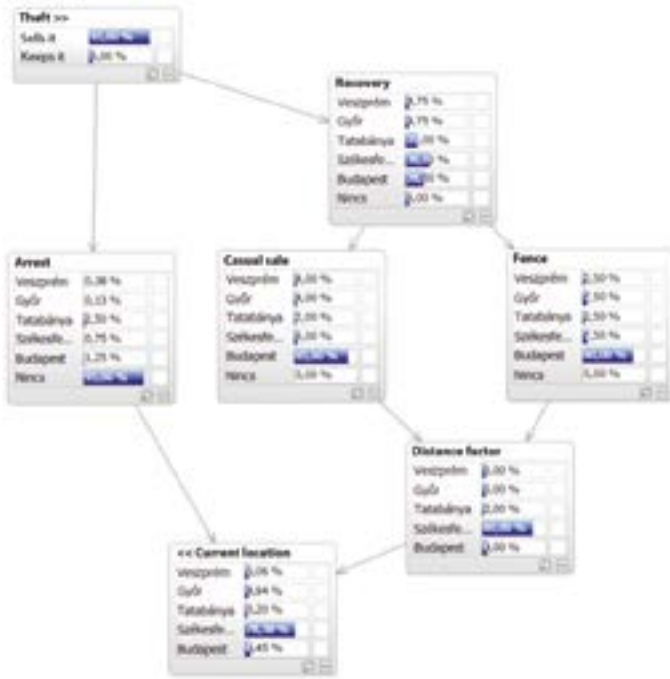

Figure 2

Calculation results of the Bayesian network complete with probability variables

Source: Author's own work

The commander leading the investigation can only focus operational resources on investigating a single location. In order to improve operational efficiency, adding the single events to the nodes of a Bayesian Network we can model their correlations and interactions. Using a table of conditional probability values we can also estimate the strength of their effect (Figure 2). A simulation like this one can reveal the weaknesses of the action plan and the measures that should be prioritized.

Summary

This study has provided a glimpse at the results achieved in the research of Bayesian Networks in forensic science. This promising perspective calls for further research into potential applications and for a more in-depth review of the areas that are already in focus. Further information on forensic modelling, detection of crime, profiling and – in the difficult case of mixed DNA samples – identification and on applications in crime prevention through the evaluation of facts can also be acquired by studying examples of Bayesian Network applications in the literature. After an example of reluctance to use this method in practice, a fictitious case study guides you through a demonstration of utility, which may help professionals working in the field and those interested in the subject understand the concept.

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Andrea Zentai

Application of Probabilistic Methods in Dietary Risk Assessment

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Abstract

The decisions taken during food control need to be based on scientifically established facts and the analysis of data, in which the role of risk assessment is essential. The four steps in internationally accepted risk assessment scheme are hazard identification, hazard characterization, exposure assessment and risk characterization, with the latter taking into account the former steps. The probabilistic exposure assessment takes into account all possible (food consumption and occurrence) values and the weight of each possible scenario. The approach enables estimation with greater information content, when enough data are available. In my research I applied this approach to national data assessing the deoxynivalenol (DON) intake from white bread consumption, captan intake from apple consumption and cumulative intake of organophosphorous pesticide residues. I focused on the intake assessment of pesticide residues, which is applicable for the intake assessment of other contaminants, too. I verified that probabilistic methods can be applicable without sophisticated computer methods, using our national databases. Using the elaborated methods when enough data are available, the dietary exposure of any food contaminant, food additive or pesticide residue can be characterized and conclusions can be drawn regarding the risk of the Hungarian population.

Keywords: exposure, dietary risk assessment, pesticide residue, food contaminant, probabilistic

Introduction to risk assessment

It is essential that only scientifically sound decisions should be made in food control procedures, in which risk assessment plays a key role. The four internationally accepted steps of food safety risk assessment (IPCS, 1999) are: hazard identification, hazard characterization, exposure (intake) assessment and, based on these, risk characterization. Toxicological evaluation of the potential effects takes place during the phases of the identification and characterization of any specific hazard. This is followed – during the assessment of exposure

– by working out an estimate or estimates of the quantity of the substance with which the hazard is associated that may enter the consumer's body. In the last – risk characterization – phase an assessment is made, on the basis of the preceding three steps and taking uncertainties also into account, of whether the hazard actually causes any health-related risk in the population concerned, and of the affected proportion of the population. In the toxicological characterization phase (Steps 1 and 2) the dose-effect relationship, that is, the extent/severity of the effect to be associated with each of the different doses studied, is usually analyzed on the basis of animal test results. This is when the NOAEL (*no observed adverse effect level,*) is established. Another – more accurate – approach is given by the technique called BMD *(benchmark dose),* in which a dose is specified on the basis of the relations between all of the analyzed doses and effects. On the basis of the NOAEL or the BMD values and in view of the uncertainties associated with the estimate, the ADI (acceptable daily intake, relevant for long term exposure) or TDI (tolerable daily intake, relevant for long term) and/or short term ARfD (acute reference dose, relevant for short term exposure) levels are finally established, as doses whose intake does not entail adverse impacts on human health.

The deterministic and probabilistic approach

Quantitative estimates of dietary exposure involves the combination of food consumption data with data pertaining to the occurrence of a compound, applying a deterministic or an – increasingly widely known – probabilistic technique. The deterministic approach – in which a typical (e.g. average or high percentile) consumption value is multiplied by a chemical residue value – does not factor in the variability and uncertainty of food consumption habits and of contamination levels, as a consequence of which it may, in cases, produce unreasonably extreme results. By contrast, the probabilistic method takes all possible relevant values into account, while weighting the probability of occurrence.

According to a tiered procedure the probabilistic approach may supplement a deterministic estimate by producing an estimate that is closer to the truth as a result of studying distribution patterns (EFSA, 2012). Distribution patterns describe the variability of consumption habits, contaminant concentrations and other relevant parameters, such as intake, making it possible to quantify uncertainty factors. The deterministic approach is, however, easier to carry out and if its result is not indicative of the likelihood of any risk, there is no need for refining it by carrying out a probabilistic procedure as well.

Probabilistic estimates require databases with sufficiently large numbers of samples. The larger the number of data the more information is carried by the estimate made using them. In practice, the procedure may be as follows: One particular day with the relevant consumption data of one specific individual (of a known body weight) has to be selected at random from the consumption database. Every single amount of food (in terms of kg) consumed by the person concerned on that particular day must be multiplied by the contaminant concentration (mg/kg) selected at random, for the given specific kind of food. The concentration data may also be selected from the estimated (adjusted) distribution of the given contaminant's concentrations (parametric technique). The intake figures calculated for each kind of food are aggregated, then divided by the individual's body weight. The process is iterated multiple time using other days' personal consumption data, producing

a frequency distribution that reflects the possible combinations of the consumption and contaminant levels. This enables the establishment of the probability of the reference value (e.g. the ARfD) is exceeded by the consumers' intakes as a consequence of the consumption of one or more contaminated food products.

The probabilistic approach makes it possible to produce estimates of increased information content, provided the necessary data are available. This is the approach I adapted in my research to domestic data to establish the characteristics of Hungarian consumers' deoxynivalenol (DON) intake from white bread consumption, captan intake from apple consumption and their cumulative intake of organophosphorous pesticide residues that have an identical mode of action. I worked out the techniques focusing on estimating the intake of pesticide residues. The same techniques can also be used for making estimates of other contaminants as well. For the calculations I used data from the latest nationwide consumption survey (Szeitz-Szabó et al., 2011), and the results of control tests performed by the competent authority, with the help of a MS Excel macro. I demonstrate the application of these methods in practice through the calculation of the Hungarian population's exposure to various types of food contaminants and pesticide residues originating from food consumption.

Deoxynivalenol intake through white bread consumption

Using the so-called parameter-based method – with adequate software support – conclusions can be drawn concerning intake from distribution functions of consumption and occurrence data. The probabilistic technique applied in our case relies on the empirical approach, using all of the available data and random sampling, with replacement, from all of the available data.

DON concentrations measured in 176 wheat flour samples and 1360 bread consumption data (Rodler et al., 2005) were used in working out the estimate. Since wheat flour is consumed in the form of bread, assuming 700 grams of flour as input quantity on the basis of its recipe a processing factor of 0.7 is applied (700g of flour / 1000g of bread). DON being relatively heat-stable, the decrease in its concentration under the impact of heat treatment was not modelled.

Consumption data and the DON concentration data reduced with the processing factor were combined together in two ways. On the one hand, 200,000 samples were taken from each of the databases by random sampling, with replacement, calculating intake by multiplying them by each other. On the other hand, each data of one database were multiplied with each data of the other database, in all possible combinations. The DON intake of domestic consumers from white bread consumption was characterized with the selected percentile values of the resulting distributions. The main percentile values of the calculated intake were summed up in Table 1.

Table 1
Distribution of the DON exposure originating from white bread consumption

Median	0.1–0.15 µg/kgbw
95th percentile	1.0 µg/kgbw
Ratio of exposure over PMTDI	~5%

Source: Ambrus et al., 2011

The provisional maximum tolerable daily intake (PMTDI) of DON (and its acetylated derivatives) is 1 µg/kgbw (JECFA, 2011). The median of the resulting intake distribution is way below the above level, but at the 95th percentile it reaches the reference value. Accordingly, in approx. 5% of the calculated exposures health risk resulting from DON intake cannot be ruled out.

Estimation of the acute intake of pesticide residues

In estimating acute intake emphasis is laid on the intake of contaminants/pesticide residues originating from food consumed in a large quantity in a short period of time. Intake of large amounts of pesticide residues may occur when one consumes a large quantity of a produce containing a large amount of residue. By agreement, the threshold for the consumption of a large amount is set at the 97.5th percentile of the individual consumptions of the consumers of the product concerned (WHO, 1997). In addition to the above, a variability factor was introduced in order to take into account the variability of the residue concentration across the sample elements (e.g. different apples). By multiplying the sample's average residue concentration with this factor a high residue content – which may be regarded as sufficiently conservative – is taken into account in working out an estimate of the acute intake with the deterministic method.

In developing an intake estimate I used a total of 4720 apple consumption data, captan concentrations measured in 378 apples (2010–2011), 1769 chemical residue variability data and the mass data of 641 apples. I took apple mass samples at random in the applied probabilistic procedure, until their sum became equal to the given day's apple consumption. I assigned one particular, randomly chosen residue value to each apple of that day and different, randomly chosen variability data to these different apples, according to the following equation:

$$ESTI_{nk} = ([R_k \times v_{i1} \times m_1] + [R_k \times v_{i2} \times m_2] + \ldots [R_k \times v_{il} \times m_L]) / bwkg_n,$$

where *ESTI* is the short term intake, *n* is the day of consumption, R_k is the average chemical residue content of a composite sample of apples of a total of *K* elements, *vi* is the random individual variability that is characteristic of the given apple (individual chemical residue / average chemical residue content), *m* is the individual mass of the given apple. The process was repeated with every single day of consumption. The typical values of the resulting distribution are presented in Table 2.

Table 2
Typical percentiles of captan intake from apple consumption

Percentile →	95	98	99	99.99
General population (µg/kgbw/day)	4.8	10	16	133
women aged 15–45 (µg/kgbw/day)	4.01	8.1	12	53.8

Source: Zentai et al., 2013

Captan's acute reference dose is 300 µg/kgbw (JMPR, 2004), established for childbearing age women. Even the high percentiles of the resulting distribution were well below the reference value. Accordingly, in the case of the calculated exposures no health risk needs to be expected.

Estimating the combined (cumulative) intake of pesticides of similar effects

Estimating the combined intakes of food contaminants of similar toxicological effects is a major challenge to food safety risk assessment today. The so-called cumulative risk assessment is a priority subject in regard to both human and environmental risk assessment, for which the elaboration and harmonization of procedures is on the agenda of the relevant regulatory bodies.

A consumer will consume multiple food products each day, which may contain multiple different chemical residues of similar mechanisms of action. Their intakes need to be assessed together, since their effects accumulate. The toxicological effects of two or more substances may appear in three different forms: *independent action*, similar action (dose aggregation) and interaction.

The RPF (relative potency factor) approach based on aggregating the doses concerned is considered to be a suitable method for assessing the cumulative dietary intake of compounds of similar mechanisms of action (Jensen et al., 2013; Kennedy et al., 2015). Doses are aggregated when the compounds concerned have similar mechanisms of action but different levels of toxicity. In such cases the combined effect of the compounds present can be established by aggregating the quantities of the compounds, adjusted for potency.

The relative potency factor method relies on the identification of an index compound, with the reference point of which (NOAEL or BMD) are the reference points of the other compounds compared (RPF), and the combined toxicity of the compounds is expressed in index compound equivalent by multiplying the various concentrations with the relevant relative potency factors and then aggregating the results. The combined (aggregate) exposure is compared with the reference value (ADI or ARfD) of the index compound.

I studied the intake of organophosphorous pesticide residues stemming from the consumption of foodstuffs made from plants (vegetables, fruits). Of the residue measurements pertaining to the selected product I focused on organophosphorous compounds. Based on the RPF approach I chose acephate as index compound and for every single sample I calculated the aggregated concentration of organophosphorous residues expressed in terms of

acephate equivalent, using the RPF factors found in relevant publications (Caldas et al., 2006; Boon et al., 2008).

Thereafter I multiplied the masses of the products consumed on the given day by the relevant acephate equivalent concentrations, and I aggregated the intakes of the various products so calculated, in each combination, for the given day of consumption. To demonstrate with a simple example: if a consumer had green peppers, tomatoes and cucumbers on a given day for which 3, 6 and 4 aggregated acephate residue concentrations were available, the estimated exposure is as follows. For green peppers and tomatoes 3 and 6 possible intake values are calculated, respectively. Adding these results in $3 \times 6 = 18$ possible combinations. For cucumber a total of 4 intake values are possible: adding these to each green pepper and tomato intake aggregates produces a total of $18 \times 4 = 72$ possible combinations. Carrying out the process with the daily consumptions of each consumer, the resulting distribution's relevant percentile characterizes the cumulative intake (Table 3).

Table 3

Typical percentile values of the cumulative intake of organophosphorous residues*

Total population (%)	**Percentile values of daily exposure (µg/kgbw/day)**				
	P 0.975	**P 0.99**	**P 0.995**	**P 0.999**	**P 0.9999**
Max	184.6	188.1	194.8	214.9	215.2
99.999	178.2	182	189.3	207.7	209.5
99.99	135.7	139.1	146.8	150.2	157.5
99.95	86.9	87.3	87.6	91.5	97
99	24.6	25.3	26.4	27.7	30.3
97.5	15.8	16.8	17.6	18.6	20
Median	0.9	1.2	1.4	1.7	2.2

Note: *The daily exposure columns contain data of the typical percentiles of the distribution of the intake combinations calculated for the various days of consumption (i.e. the variability of the possible intakes of the given days of consumption). The data in the column for the entire population indicate the typical percentile values selected from the distribution of these percentile values (the variability of the population's intake).

Source: Zentai et al., 2016

Acephate's acute reference dose is 100 µg/kgbw (JMPR, 2005). In regard to the distribution of the 99th percentile intake data calculated for the various days of consumption the cumulative intake remains below the reference level on 99.95% of the days of consumption. It should be noted that the application of the relative potency factor method requires a very careful approach. The European Food Safety Authority (EFSA, 2012) emphasized in relation to its definition that toxicological information should preferably originate from an assessment of the same species under similar circumstances. Where different uncertainty factors are applied, those should be adjusted before the RPF calculation. Moreover, the index compound should have a good toxicological description of the combined effect. In this regard exposure estimation is, to some extent, interlinked with toxicological considerations. For this reason, in my calculations I used relative potency factors already published by other authors.

Conclusion

Due to the need for using large quantities of data, working out risk estimates requires software support. One such program, which is applied in Europe, is called MCRA *(Monte Carlo Risk Assessment)*, whose development is based on the most recent recommendations. The development of this particular software tool is a continuous effort in view of suggestions and proposals received from users and other stakeholders. Should it get to be widely adopted as a routinely applied technique in other countries, its introduction in Hungary may also be worth considering.

The paper highlights the complexity of dietary risk (exposure) assessment, reflecting that regulatory institutions are making efforts at developing a harmonised methodology. The use of probabilistic techniques will become indispensable in risk assessment in the future; given the amount and type of information required these methods necessitate carefully planned and well organized data collection and storage as well. Growing consumer awareness, the introduction of new active ingredients and the development of analytical techniques call for up-to-date methods of assessment and estimation and require the availability of authentic information on the (combined) effects of harmful substances entering the human body.

With the help of the methods that have been developed we have proven that probabilistic techniques can be adapted to risk assessment considering domestic databases even without any specific major software background. The methods worked out enable – if sufficient quantities of data are available – the characterization of the intake through food consumption of any food contaminant, additive or plant protection product residue and the drawing of conclusions concerning risks facing the Hungarian population.

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Afterword

Reading habits vary greatly. Some people start perusing a volume at the beginning and turn the pages until they reach the end as if it were a novel, while others consult the table of contents first and become absorbed only in the parts of particular interest to them. And there are those who skip the introduction and the concluding thoughts, believing either that these are merely formal parts containing no information, or such parts, where the lessons are drawn from the book – which they are able to do by themselves, in accordance with their own values.

In my view, the latter, the concluding comment, has a different role than the above described. The task of the writer of the afterword is to express subjective views on the topic – like the authors, though much more succinctly and without scientific rigour.

If the essays were limited to the scope defined by the title of the book, the volume would not have much added value. Essentially, we all know what the security challenges are. Answers and ways of resolving the problems are required – solutions that are realistic, that adapt to the intellectual, technical and financial capacities of the specific country; solutions that are effective and can at least thoroughly hinder, if not entirely prevent, harmful endeavours – and this is no small achievement.

In my opinion there are many useful thoughts in this volume from this point of view. The proposed solutions were put forward in a fortunate period in the sense that the months prior to the parliamentary elections are a period of deep thinking rather than active law-making.

The essays in the volume – some in themselves and others through broadening or developing ideas by the authors or readers – may lay the foundations for a security strategy (in a non-legal sense) and for a type of system-level solution which, either in whole or in part, may provide guidelines concerning security measures for the government to be formed after the parliamentary elections.

László Felkai
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President of the Academic Council of Home Affairs

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The environmental problems, global socio-economic changes and migration processes over recent decades have brought to light threats and difficulties which altered the interpretation of the subject over security, gave rise to differentiated needs, and introduced new areas and issues. Thus a complex systematic review of the security challenges has become very timely.

Bearing in mind the importance of this topic, the Academic Council of Home Affairs decided to publish a volume of essays under the title *Security Challenges in the 21st Century*. This book, whose importance is underpinned by recent acts of terrorism, provides a broad insight into the latest security challenges of the 21st century and suggests answers to these.

This non-profit publication has three chapters. The essays in the first two chapters were written by academics establishing new schools of thought. The authors of the essays of the first chapter, *The Importance of Security in the 21st Century,* analyze the changes that have occurred in recent decades, and identify current potential threats and hotspots. The second chapter, *The Security Challenges of Strategic Forecasts,* focuses on future security challenges and trends. The authors outline the probable lines and patterns of development that may arise from the current situation, and propose solutions for dealing with problem areas, taking the necessary measures and implementing innovative developments and managing the identified conflict areas at a local and global level. The third chapter, *Interdisciplinary Responses,* presents the research findings of promising young scholars in the early stage of their careers.

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