

Cybersecurity of the Hungarian Municipal Administration: Challenges of a Fragmented System

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Abstract In this chapter the situation and the challenges on the cybersecurity issues of e-administration services and practice of Hungarian municipalities will be analysed. However, the cybersecurity of the municipal administration became an important part of the local decision-making and administration in Hungary, it has several challenges because of the fragmented Hungarian municipal system. The regulation on local cybersecurity issues focused on the development a horizontally integrated e-administration. Although the acts on this system have been passed in the last years, and the former restrictions of the electronic administration have been eliminated, but the practice of the Hungarian e-administration is partly different. The new, enhanced e-administration resulted new challenges, which was partly solved by the radical nationalisation and centralisation of the former municipally performed tasks. The municipal e-administration systems have been built mainly by the largest municipalities, but their operation could be further developed, and thus the municipal cybersecurity is a developing part of the Hungarian public administration tasks, as well.

Keywords: • digitalization • e-administration • cybersecurity • Hungary • digitalization of municipal authorities • municipal administration

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1 Introduction

Today, the digital revolution has also caught up with the administration. E-governance has many advantages. For example, clients are not tied to office hours, do not have to meet with officers, they can access information more easily, and many tools are available to help them make decisions (Bowman & Kearney, 2016: 223). The *e-government* is an umbrella term: it covers the government innovation and the government information and services – according to the relevant literature. The aim of e-government is often referred as the paperless office, which means that electronic administration converts paper processes into electronic processes. E-government creates a lot of ways that in governments and citizens can communicate with each other. As a result, clients become the actors of the administrative system (Wohlers, 2010: 89-90).

The e-administration and e-government has not only benefit, but it has several risks. During the e-administration sensitive data are used and stored by the administrative bodies, and the sensitive data of the administrative decision-making can be used for these activities. Therefore, it became a major issue to defend the data and information on the citizens of a given administrative unit and the defence of the data and information on the given administrative body. Cybersecurity became an important element of the digitalisation of the public administrations (Fuster & Jasmontaite, 2020: 107).

Cybersecurity and e-government has another important questions: the smart cities and the platforms of the municipal administrations and services are mainly based on and are backed up by the centralised government data banks and systems, and the accessibility to the date of these systems are regulated centrally. Therefore, there is a challenge of a new type of centralisation which will be even examined by this paper.

Municipal e-administration have an important issue in the last two years: the COVID-19 pandemic has been an opportunity, a challenge, and a threat for the local public administrations, especially for the local e-administration. The application of the e-administration has been strengthened by the reduction of the contacts between persons. Therefore, the tools and institutions of e-administration has been widely used by the administrations during the time of pandemic. The application of the e-administration could be interpreted not only as a challenge and opportunity to build a more effective administration, but it has only several risks, as well. The cybersecurity issues of the different administrative systems have become a recent question, as well. These trends can be observed in Hungary. As it can be seen, the Hungarian administrative law had diversified and detailed regulation on e-administration, but the extended application of the tools and institutions of e-administration has had several – especially in the field of cybersecurity.

This chapter focuses on the challenges of the municipal administration in the field of the cybersecurity, especially the role of the municipalities as authorities. The central elements

of the review are the analysis of the legal regulation on (municipal) e-Government e-Administration and cybersecurity and secondly the review of the digitalisation of the Hungarian municipalities and especially their responsibilities in the field of the defence against cyber-attacks.

2 Methods

First of all, the analysis is based on the methods of the *jurisprudence*. Therefore, firstly the concept and the legal regulation on the digitalisation of the administrative services will be reviewed, especially the services provided by Hungarian municipalities. As part of this analysis the basic elements of the concept of the e-administrative services will be shortly shown. After that I would like to analyse the framework of the regulation on cybersecurity in the Hungarian municipalities.

The expectations – the legal regulation – and the reality could be compared. Not only the legal regulation has been analysed but I tried to show the framework of the Hungarian challenges, the recent situation of the Hungarian municipal administration and the link between this situation and the cybersecurity challenges.

3 The analysis of the regulation on the eGovernment and its cybersecurity issues in Hungary

Firstly, I would like to examine the analysis of the regulation on eGovernment, especially on the e-tools of the authorities in Hungary. After this analysis we would like to review the actual situation of the e-administration in the large Hungarian municipalities. But as a preliminary issue, we would like to analyse the interpretation of the e-services, especially the e-services of the Hungarian municipal administration.

4 Municipal e-administrative services

The e-services are different, and the different stages of e-administration is distinguished. Four main stages of the e-government development are distinguished. This classification is based on the integration of the different services and on the complexity of the structures and technology. The first stage is the *catalogue*, in which the online presence of the government is provided, the main tasks are catalogued, and the several forms could be downloaded. The second stage is the *transaction*, in which the services and forms are online, and the online transactions are supported by several working databases. The third stage is the *vertical integration*, in which the local systems are linked to higher systems (within similar functionalities). The fourth stage is the *horizontal integration*, in which the systems with different functions are integrated and a real one-stop-shop is provided (Layne, 2001: 124-125).

It is highlighted by the literature, that significant investments are required to fulfil these aims, and the costs of these investments are partly related to the cybersecurity issues (Heeks, 2006: 107 and Légárd, 2020: 92). But the e-government technologies have several prerequisites. After Layne and Lee three vital condition should be fulfilled to implement a successful e-government reform: universal access to the e-government tools, the defence of privacy and confidentiality and – last but not least – the citizen focus in government management (Layne, 2001: 134 and Chałubińska-Jentkiewicz, 2021: 178-181).

5 Municipal e-administration in Hungary - a short review

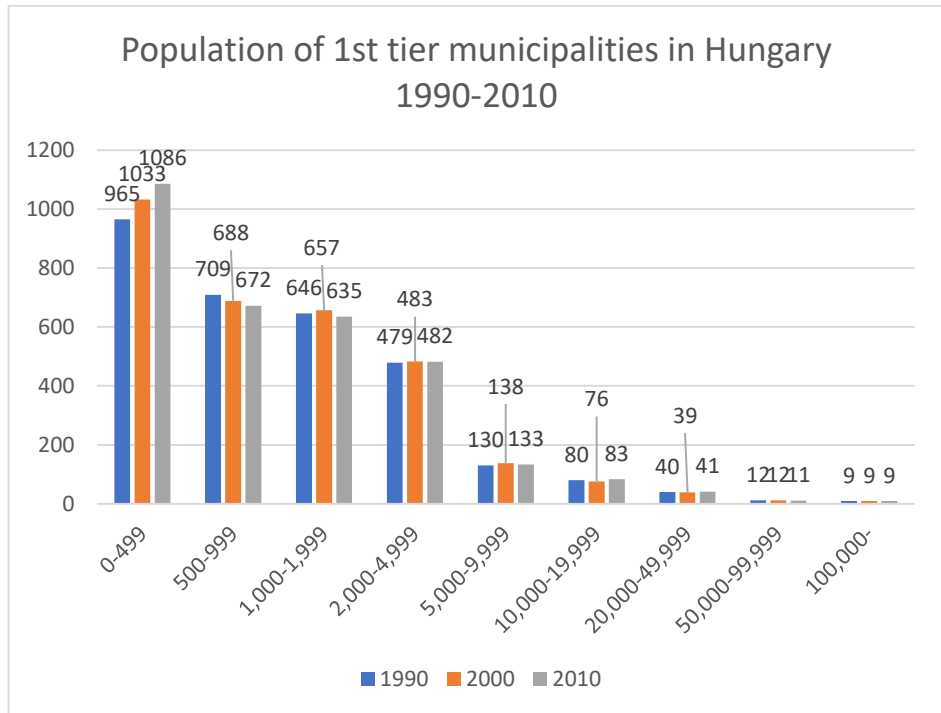
The Hungarian public administrative system was a highly decentralised one before the reforms of 2011/2013. After the Democratic Transition a very fragmented and very autonomous municipal system evolved.

Table 1: Population of the Hungarian municipalities (1990-2010)

Year	0-499	500-999	1,000-1,999	2,000-4,999	5,000-9,999	10,000-19,999	20,000-49,999	50,000-99,999	100,000-	All
	Inhabitants									
1990	965	709	646	479	130	80	40	12	9	3,070
2000	1,033	688	657	483	138	76	39	12	9	3,135
2010	1,086	672	635	482	133	83	41	11	9	3,152

Source: Szigeti, 2013: 282.

Figure 1: Population of the Hungarian municipalities (1990-2010)



Source: Szigeti, 2013: 282.

The majority of the tasks of the local authorities belonged to the competences of the local bodies especially as delegated administrative tasks of the officers of the Hungarian municipalities. Therefore, the general first instance body of the Hungarian public administration was the municipal clerk before 2010 (Fábián & Hoffman, 2014: 330). Therefore the eGovernment issue of the Hungarian local government system became a significant element of the Hungarian strategies and service provision.

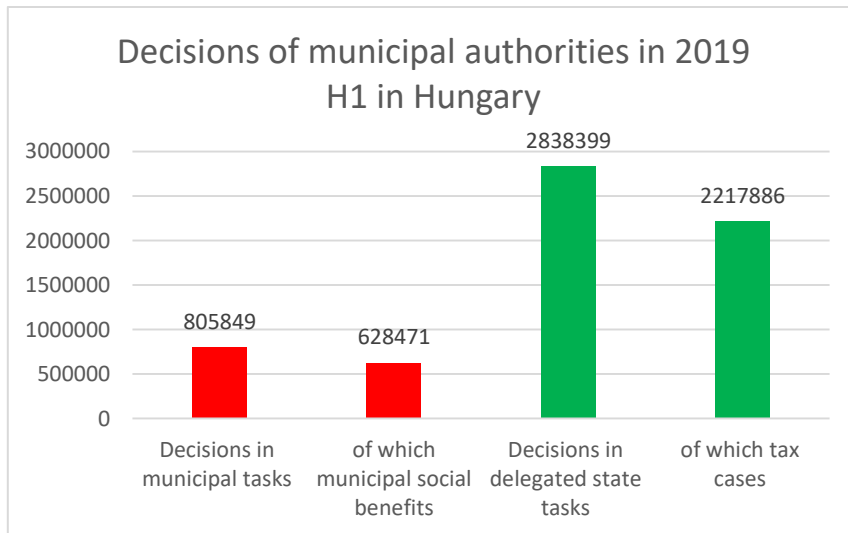
In Hungary the development of the municipal e-administration was partly a ‘from bottom to top’ initiatives, especially in the large municipalities, but it is highlighted, that primarily the local e-administration was a top-bottom initiative (Hoffman & Cseh, 2020: 199-211). Now a unified government portal has been organised and the local (municipal) systems are integrated in it.

The evolvement of the municipal eGovernment system begun at the end of the 20th century. Several problems have been occurred: firstly, the general administrative knowledge of the citizens and the accessibility to the e-tools were limited. Therefore –

and because of the limited form a bottom to the top approach – the online presence of the larger municipalities were provided in the early 21st century. As it will be reviewed later, the Act XC of 2005 on the freedom of electronic information was a turning point. New platforms were developed in this time, firstly in several sectors (for example in the municipal finances, later in the field of construction administration). An integrated national system has been developed after the Millennium, the www.magyarorszag.hu site and the Government Portal and its Client Gate. Originally the municipalities were not fully integrated, but the tendency of integration has been strengthened. After the reforms of 2010 the integration of the local and central was an important reforms issue (Budai, 2013: 134). A new model of the municipal e-administration was evolved after the amendment of the administrative and tax procedural acts, because the municipalities should provide fully electronic administrative platform in the field of local taxes.

After 2010 the recentralisation and the concentration of the public administration can be observed in Hungary. Till 2013 the municipal clerks were the major 1st tier authorities in the Hungarian system of the public authorities, but it changed by the establishment of the district offices of the county government offices and by the transfer of the competences to the district and county offices from these municipal officers (who performed state administration). However, the municipal clerks perform significant competences, but it should be highlighted, that the majority of the municipal decisions belongs to the delegated state-tasks (which are actually central tasks, but because of the grassroot administration they are performed by local – municipal – bodies).

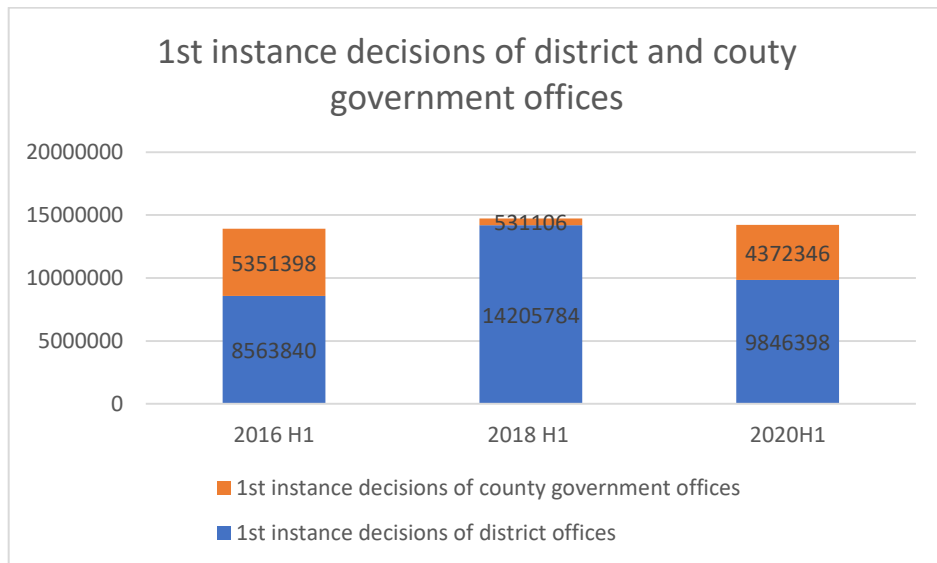
Figure 2: Decisions of municipal bodies in Hungary



Source: OSAP, 2020.

Therefore, the fragmented local administrative structure has been a challenge to the Hungarian public administration system. As we have mentioned, one answer was the centralisation of the competences to the district and county government offices. Now, the major 1st instance authorities are these bodies, as it can be seen at the Figure 3.

Figure 3: 1st instance cases of the district and county government offices



Source: OSAP, 2020.

The second answer of the administrative reforms to the fragmentation of the municipal system was the concentration of the competences. The new Act on the Local Self-Government of Hungary (Act CLXXXIX of 2011) stated, that joint municipal offices shall be established by the small municipalities (municipalities which have less than 2000 inhabitants). Thus, the main form of the rural local administration became the joint municipal offices (see Table 2).

Table 2: Joint municipal offices and independent municipal offices in Hungary (2020)

Number of municipalities in Hungary	Independent municipal offices	joint municipal offices	Number of participant municipalities
3 153	521	749	2632

Source: KSH, 2020.

These transformations impacted the municipal e-services and the cybersecurity issues of them.

6 The legal framework of eGovernment in Hungary

It is a main strategic goal for Hungary to modernize its public administration. The goal is to increase the use of modern information and communication technologies in the communication between state institutions themselves and between state institutions and citizens. During the last few years, considerable measures have been taken by the Hungarian government to reform the public administration of the country. The most important results of these reforms include the reduction of administrative burdens and the simplification of administrative procedures.

From October of 2009 (with Act CXI of 2008) the general administrative procedure rules were amended. Electronic communication between clients and authority became available through the use of an online citizen portal dedicated to this end, called Client Gateway.

In April 2012, with the amendment of the Act CXL of 2004 on the General Rules of Administrative Procedures and Services by the Act CLXXIV of 2011, and the introduction of the so-called regulated electronic administration services, the legal preconditions for eGovernment services were established (Baranyi, 2013: 222-225). In addition to this, in July 2015 a new law on the Hungarian eID card has been adopted.

As the scope of the Hungarian eGovernment developments continuously grew, the need for a separate eGovernment law appeared. Act CCXXII of 2015 on the General Rules for Trust Services and Electronic Transactions (hereinafter referred to as ET Act) kept the achievements of the 2012 reform and further extended the possibilities of electronization of processes.

As of January 2018, a new act regulating administrative procedure entered into force (Act CL of 2016 on the Code of General Administrative Procedure). In Section 26, the new act also regulates the communication of the authorities with clients and utilise the electronic communication means provided by the ET Act as a form of written communication. (It is also allowing electronic communication not in accordance with the ET Act, but that is regarded as oral communication.) The new Procedure Act, according to its general concept, is not containing detailed rules of this form of communication but rely entirely on the ET Act. There is also an option to deliver the decision by the ET Act, in place of an official document, regulated in Subsection 3 of Section 85 (Baranyi, 2017: 317-319).

According to the ET Act, it is mandatory for municipal governments to provide the option for electronic communication for clients. To be precise, it is mandatory for almost

all governmental bodies to provide this option. There are only few exceptions to this rule: when an act or government decree adopted in a vested legislative capacity creates an obligation for the physical presence of the client, or for the submission of documents that may not be obtained in any other way; where it is not applicable; when it contains classified information or when it is excluded by an international treaty or a directly applicable Community legislation that is binding in its entirety (Section 8 of the ET Act).

Clients shall have the option to make statements, take procedural steps and fulfil other obligations either through a single, personalized communication interface or through e-governance services platform if it is provided (Section 10 of the ET Act).

The ET Act contains the general rules of the electronic connection between the body providing e-governance services and the client, as well as the provisions on the IT cooperation between the body providing e-governance services and other bodies. An important provision for local authorities is provided in ET Act. According to Section 17. b), local authorities are bodies providing e-governance services which are obliged to ensure electronic administration services as specified in the ET Act from 1 January 2018. ET Act Section 9 (1) paragraph a) and b) also states that electronic communication is mandatory for economic operators acting as clients and for the legal counsels of clients from 1 January 2018. There is an obligation to maintain electronic communication, then any statement not in compliance with this regulation shall be deemed invalid. The only exception under this regulation is when the client can't maintain electronic communication due to a failure of the system on behalf of the authority, when the electronic administration service cannot be accessed or when the required forms can't be reached because of it wasn't provided.

For clients, ET Act does not make electronic communication mandatory but it gives them the opportunity to use this form of communication.

In general, it can be said that in any type of cases local authorities provide the electronic administration services for their clients via electronic form services on their websites or in other cases through e-Paper services. In cases in which it is not possible to use electronic forms, clients are required to use the e-Paper services. In most cases, the electronic form services can be used through Client Gateway, which is the most widely used and most essential eGovernment application in Hungary.

E-Paper is a general purpose electronic application form, a free, authenticated messaging application that connects clients electronically with the institutions and bodies connected to the service via the Internet. The purpose of the e-Paper service is to enable the client to submit a complaint to the authority electronically for those procedures or simple matters which are not supported by a system of expertise for their frequency or other reasons. The e-Paper service is available through Central Identification Agent, at <https://epapir.gov.hu>.

The public services are another important issue of the cybersecurity of the local administration. These – mainly human – public services have been widely centralised in Hungary during the 2010s, thus the Another important formerly municipally managed public education, health care, residential social and child care and several cultural services are now provided by institutions which are mainly maintained by the central administration and by its territorial agencies (Hoffman et al., 2016: 462-467). Therefore, new platforms have been evolved, which provide information and data for the service provision, as well for financing these services. Such an e-platform for the public education is the *KRÉTA* system, for the health care services the *EESZT (Elektronikus Egészségügyi Szolgáltató Tér – Electronic Health Care Provision Space)* and the unified social register. The providers – which are maintained mainly by the agencies of the central administration, however there are municipal maintainers and the churches and NGOs have maintainer tasks, as well – have direct connection to these systems. The major elements of these platforms are regulated by Act of Parliaments and the executive decrees issued by the Government of Hungary.

As we have mentioned earlier, this process requires significant human and financial resources. The digitalisation and the eGovernment investments and reforms in Hungary – as an element of the economic and regional development – is co-funded by the European Union. The support of the digital and e-administration is an important objective of the operational programme supporting the development of the Hungarian public administration and public services (Közigazgatás-és Közszolgáltatás-fejlesztési Operatív Program – KÖFOP). The municipal e-administration projects are funded by this programme, as well.

7 Transformation of the legal framework of the municipal e-administration

There is also an online system, called The Local Government Office Portal (hereafter referred to as Portal) which is the location of the e-government administration in the local ASP system. The Portal provides municipalities with a local government ASP system for both natural persons and legal entities, providing the opportunity to use electronically available services for specialist applications.

Through the Portal, the clients can query for a local tax balance, the status of local government affairs electronically initiated by the Portal. They can also initiate an administrative action using it. At present, the local government's tax, industrial, commercial, estate inventory, estate protection, birth and social affairs are supported by system development through the local ASP system. The application provides customers with the opportunity to track the process of their administrative procedures over the Internet. The Portal is mostly used by smaller municipalities, bigger cities both with and without county rights (which are the scope of this paper) normally use their own websites.

Another important field of the municipal e-administration is the *Smart City* programs. Although the welfare and cultural services are significant elements of the Smart City services in the majority of the developed countries (Lytra & Visvizi, 2018: 2000-2006), the Hungarian regimes do not follow the international patterns (Henk, 2018: 231-237). The main reason of the different Hungarian pattern is that the majority of the welfare and educational services were nationalised and centralised between 2011 and 2016 therefore, the role of the municipal administration is limited in these sectors. Secondly, the 'customers' of these services have interest in smart solutions. This attitude has been amended during the COVID-19 pandemic and the regular use of the health platforms have been increased (Hoffman, 2021: 152-153). The approach of smart city is based on the role of the ICT technologies as a platform of the more efficient local service provision. One of the major fields of the smart city solutions is the *local transportation*. First of all, new platforms for the provision of public transport services were introduced by the larger Hungarian municipalities. Such a unified public transport platform is the BKK FUTAR in Budapest, which allows to control and to observe the public transport services of the Budapest Transport Company. Secondly, the street parking has been reformed by digital service and by new local platforms. However, these street parking platforms were developed by the municipalities, but they have direct link to the centralised Hungarian national mobile payment system, therefore, it is partially centralised.

As I have mentioned earlier, the municipal platforms can be interpreted as a tool for the 'soft' or 'latent' centralisation. These local systems are mainly based on data provided by the centralised databank and platforms. Therefore, the access to these central systems is a crucial element of the operation of these local systems. Because the access to these data are managed by the central systems therefore, the operation of the local systems are partially determined by the central system and by the access to them. Thus, the central government can influence and impact the local service provision. This impact can be interpreted as a soft one, because the impact is not direct, it is based on the use of the centralised databanks and on the architecture of these central regimes.

8 Cybersecurity issues and municipalities in Hungary

Cybersecurity became an important issue of the municipal administration after the Millennials, especially after 2010, when the eGovernment and the municipal e-services began to evolve rapidly. Thus, cybersecurity became part of the public order and safety policies of the Hungarian administrative system. This transformation has been similar to the changes of other Visegrád Countries (Karpiuk, 2019: 30 and Czuryk & Kostrubiec, 2019: 34-36).

After the challenges of the new era, especially to ensure a better defence of the administrative cyberspace, a new regulatory approach has been evolved after 2010. A general act on the cybersecurity of the central and local government bodies was passed in 2013. This framework act, the Act L of 2013 on the cybersecurity of state and municipal

bodies (hereinafter: CSA) follows the major principle of cybersecurity regulations. It is based on the 'CIA' principle; thus confidentiality, integrity and availability shall be secured by the cybersecurity activities. Security classes and measures are defined by the Act; however, the detailed regulation can be found in an implementing ministerial decree. Following the general approach, the tiers of cybersecurity defence are defined and regulated by the CSA. The Act follows the general regulation, and especially, because its scope is a very wide one, and even the Hungarian military forces are affected, it follows the NATO regulations as well, not only the EU rules (because of the Hungarian NATO-membership).

A centrally supervised system has been regulated: the major body responsible for cybersecurity issues is in Hungary the Ministry of Interior, because cybersecurity is interpreted in Hungary as mainly a public order and security issue, the military elements are important, but a general regulation has been established. The central body of the cybersecurity issues is one of the national security agencies (which are supervised by the Minister of Interior), by the Special Service for National Security (Juhász et al., 2020: 136-138).

9 Challenges of the municipal cybersecurity in Hungary

The Hungarian regulation – including the CSA – fit the strict and detailed European and NATO requirements. Thus, the major challenges of the municipal cybersecurity are linked to these requirements. As we have mentioned earlier, in Hungary there are more than 3000 municipalities (for a population which is less than 10 million inhabitants) and there are 1270 independent municipal offices, whose majority are relatively small offices (typically they have less than 20 civil servants). These offices have often lack of resources and lack of human capacities, especially in the field of cybersecurity. Because of the existence of delegated state tasks, these municipalities have links to the central systems, especially to the registrations of the population and their addresses. Therefore, these small offices can be an Achilles heel of the Hungarian system, because they are more vulnerable than the national(ised) systems.

Even the larger municipalities have significant cybersecurity issues: the local platforms and their links to the centralised system can be even vulnerable, and it is important to protect them. However, the centralised protection of these systems can be even interpreted as a new model and soft centralisation of the service provision.

10 Conclusions

The digitalisation and the e-administration are important issues of the public administration reforms of the last decades. The challenges of the new, digital ages resulted the transformation of the traditional administration. As we reviewed, the Hungarian regulation on eGovernment and on the digitalisation of the public administration

transformed significantly. The regulation was focused on the development a horizontally integrated e-administration. The practice of the Hungarian e-administration is partly different. The municipal e-administration systems have been built by the municipalities (especially by the larger municipalities), but their operation could be developed. The fragmented municipal system and their links to the national systems could be a vulnerable element of the Hungarian cybersecurity system, however, the regulation and the supervision activities are detailed regulated and have evolved quickly during the last years. However, the centralised systems and their centralised protection can be interpreted as a new model centralisation, because the local service provision are influenced by these national systems.

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