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Investigation of Smart Tools in Order to Improve the Effectiveness of the Administration of Disaster Management I.

Abstract
The security of a well-functioning country requires an administrative and defence management system. The author presents the operation and activity system of the Hungarian disaster management organizational system, paying special attention to the examination of smart devices that improve the efficiency of public administration. The author demonstrates in his research that the use of smart devices and technologies contributes to the reduction of disaster risk, damage, and helps disaster prevention. Based on the applied research methods, the author proves that due to the identified problems, the increasing number of inspections and the growing information society expectations require us to use the tools and technologies of disaster management authorities to strengthen the safety factors.

Keywords: e-governance, disaster management, Industrial 4.0, IoT, efficiency

Introduction

For the security of a well-functioning country, it is essential to have a public administration with a defence administration within, in order to research developments and innovations aimed at continuously increasing its efficiency (Teknős, 2018, 242-243.). In the 21st century in Hungary the development of the country's ability to defend itself against external attacks became regulated in an advanced way as compared to the expectation of the age. While hundreds of years ago defence was based on combating military/armed attacks, today, in the 21st century, defence appears to be a much more comprehensive and complex concept. To develop effective protection, complex top-down structured organizational background and qualified personnel on different levels are required. The

current advanced information technology tools and IT background are needed as well. It is also necessary because disaster management is a national affair (Lakatos & Teknős, 2019, 167-180.).

Within the current disaster management organization system in Hungary, my research is focusing on the examination of 'smart' tools that improve the efficiency of the official administration of those carrying out official activities. The aim to substantiate my claim is as follows: effectiveness of the official administration of disaster management bodies and the level of security itself can be significantly increased by the applicable smart tools and technologies. This contributes to the prevention of damage, disaster risk and subsequent disasters (Endrődi & Teknős, 2014, 235.). To substantiate the above claim, given the quantity limitations of this article, I begin by historically reviewing the latest industrial revolution, the emergence and applicability of smart devices, their impact on public administration, legal provisions. Then I examine what could be done by these enhancements, IoT tools and software to create a more effective method in disaster management.

The Concept of Industry 4.0, Iot Technology and Smart City, Their Impact on E-Government

Since the existence of mankind, information itself has played a significant role in continuous development. Information that we collect, process, and later on transmit is essential to our existence. These forms, tools, and methods have undergone continuous development throughout history. In the history of mankind, a connection can be found between the fact that some eras' stronger and more advanced civilizations were able to play a decisive role in their era because they had more and better information than other civilizations and peoples. This means information is a power that provides the chance to always be one step forward. The basic forms of technical implementations of information management have been constantly evolving. Newer and newer procedures and technologies have been invented and applied for their own implementation. There is no accepted definition of information, but for the most part, information is considered to be data or news that has a relevance and a lack-of-knowledge-reducing function to solve a given issue. Information can also be seen as a set of facts, i.e., a reflection of reality (Munk, 2007, 9.). Increased efficiency through information has resulted in industrial revolutions that have had a major impact. These revolutions generated changes in the technological, social, economic and organizational set-up of a given historical period, as well as a significant

impact on spatial processes and regional development. In my opinion, the ongoing industrial revolution, which began in the last decade and is unfolding in front of us, is based mainly on the knowledge-based use of information and its significant digitization. This process is considered to be the fourth stage of industrial development, which focuses on the rapid development and evolution of cyber-physical systems, which is Industry 4.0.

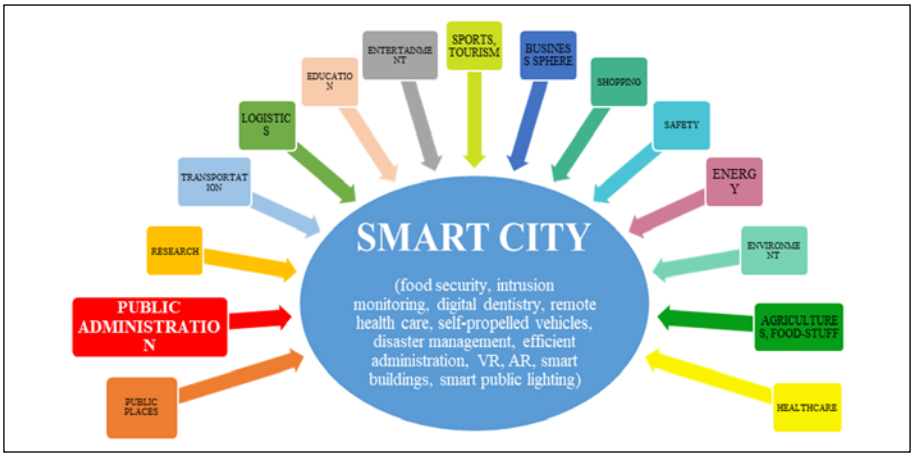
In order to maintain the continued leadership of the German industry, the government announced a significant industrial development (URL1), in which the first industrial digital development funds were laid in Hanover in 2011, designated Industrie 4.0, i.e. Industry 4.0 terminology (Kagermann, Wahlster & Helbring, 2013, 6.).

In 2016, the National Technology Platform published the definition of Industry 4.0, according to which *'The concept of Industry 4.0 refers to the fourth industrial revolution, which is based on cyber-physical systems. This means the previously non-existent integration of real and virtual reality, implements the organization and regulation of the entire value chain to a new level throughout the entire life cycle of products. The cycle follows increasingly individualized customer needs and extends from product conceptual design, through ordering, product development, manufacturing to delivery to the end user, and recycling to all stages of the process, including product-related services. The basis of all this is the real-time availability of all relevant information, which presupposes the networking of the objects in the value chain, as well as the ability to determine the optimal value flow from this data at any time. By connecting people, objects and systems, dynamic, real-time-optimized, self-organizing value-added networks beyond the enterprise framework are created that can be optimized according to various criteria (cost, availability, and resource utilization).'*

The goals of Industry 4.0 are also reflected in the activities of government and related administrative personae. Technological developments and the accelerating world require that the necessary regulatory decisions, inspections, and controls be even more reliable, faster, more accurate and more efficient. Therefore, it can be stated that public administration is also an integral part of the technological development sector of Industry 4.0, as it forms a kind of counterbalance to the civil sphere. In order to this, it creates security that is necessary to guarantee the search for continuous innovations and the effective application of existing ones. The impact of the above Industry 4.0 revolution is also affecting our own close living space, so technology, computing and info-communication tools can make our everyday lives more efficient, convenient and the tasks ahead more effective. The IPv4 version of Internet protocol allows the development of IoT technology, which will be explained later. These are the information and communication

technologies needed to create a smart home, city, and country. Networking, i.e., the possibility of technical devices to communicate via the Internet, as well as the development of sensors and the improvement of their communication skills also significantly increase the number of data and information that can be collected at the same time. Cloud-based services have been created and are receiving more and more emphasis for storing this amount of data, which, in addition to storing information and data, will also play a major role in their processing in the future. A single, generally accepted definition of a smart house, city and country has not yet been developed, but all definitions are based on the use of info-communication solutions. Smart homes must be part of smart cities. The digital city and country have to go through a three-step development process, to be able to talk about a digital city, an intelligent city, and a smart city. Sequence is a kind of development wave that can be increased by improving different levels of development and services. In order to achieve these, we can define special functions and elements for the smart city and country, which are necessary for their design. Thus, real-time data collection is needed with the help of sensors installed in both private and public areas. The analysis of the collected data is also essential, planning and forecasting are given priority. Control of urban utilities as infrastructures, emphasizing the role of critical infrastructure protection, providing smart urban applications. Developing tools for community participation, and providing high-speed internet access at a quality and price accessible to all. These are essential for the smart city and country to be built, and if provided at the same time, then we can talk about a smart city and a smart country.

Figure 1: *Smart city segments and possible areas for smart applications*



Note. Created by the author.

For the development of present, it is essential to fully digitize the arenas of the above smart devices. Many of the applications related to the smart city are already available, which have appeared in almost all areas of our daily lives. The figure above shows, by way of an example, that the smart urban applications can be relevant in all areas of life. Public administration is also one of the segments necessary for the completion of a smart city, which also includes disaster management.

It is the characteristic of our world in the 21st century that smart devices, emphasizing mobile devices, came first in info-communication technology. Their spread and development dictate a rapid trend, and this process, a wave of development, will intensify further.

The size and complexity of the Internet network is constantly increasing due to the number of millions and billions of sensors connected to the network. These sensors and devices form the culmination of the Internet of Things (IoT) as a concept. Wired technology is still 'only' one billion, while mobile technology is already connected to the network by seven billion people, not counting our many devices that can communicate with wired and wireless technology, which are also connected to the network and form an even larger set of information.

'IoT can be interpreted as a worldwide network of uniquely addressable devices, objects and objects with their own IP address, which uses TCP/IP as a communication addressing protocol. IoT is usually a network of various sensors and actuators. The sensors detect changes in the state of the environment due to physical, chemical, biological, etc. in their sensing range, and the actuators intervene in the operating processes on the basis of the detected and the evaluated data. The cloud-based computing technology described earlier is an extremely important part if IoT, as it allows the use of the computing resources needed for different activities.' (Haig, 2018, 97-98.).

It can be well seen from the above concept that the Internet of Things is ultimately the point of development of the Internet. It has become possible for the tools and objects used every day to be able to connect to the Internet and perform mutual information solutions.

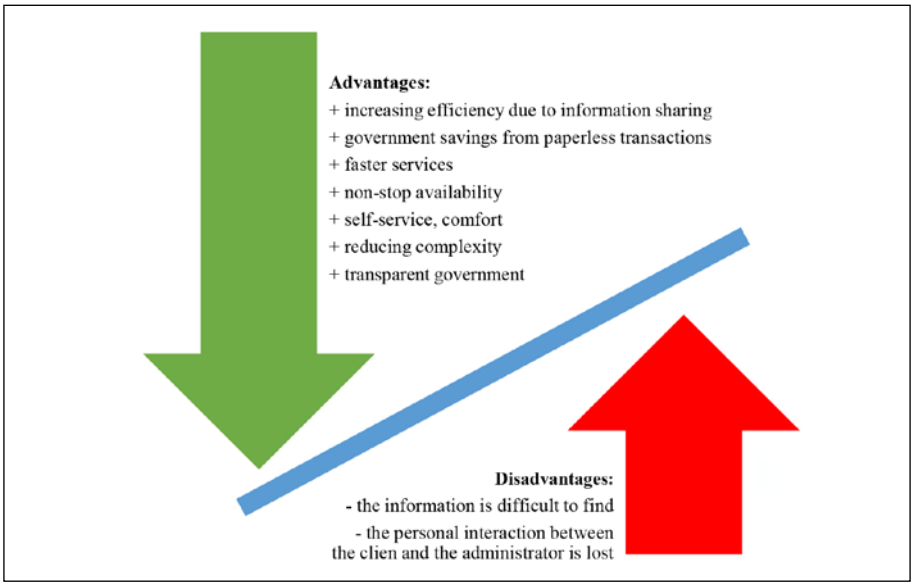
The appearance of the IoT was necessary and its application at the individual level also appears in smart homes. It also plays a significant role in the feasibility of the smart city concept and based on the above we can see how many infrastructures and all sectors, particularly law enforcement, national defence, healthcare, critical infrastructures, industrial companies, public safety are needed to be sensored to make the concept a reality. A positive effect can also be achieved in public administration systems by using smart tools, so the efficiency of customer authority communication can be improved. These

0-24-hour online administration interfaces can be provided from anywhere at any time, and also provide more application, system and device. By applying them, administrative activity, official administration, official procedure can be faster, more precise, and more efficient. The need and importance of public administration for development is also a priority for the European Union itself, as it is essential to improve digital cohesion in order to increase economic competitiveness. In addition to increasing competitiveness, it also brings social development and the state of social well-being. *'Closing the gap between the 27 Member States, widening administrative burdens in general, introducing efficient services and reforming the public sector and public administration in general are important elements of EU and national policies. These include Digital Agenda, the H2020 research programs for the E-Government Action Plan.'* (Nemeslaki, 2018. 2-5.).

Electronic, i.e., E-government, nowadays covers an increasingly used term, and even the foreign language equivalents of E-government and e-governance are used. Today, E-government itself has become an interdisciplinary field, as several disciplines deal with it, and the principles it targets connect the disciplines as a bridge. E-government could be characterized with a kind of approach and tool system aimed at modernizing state and local government administration.

What do we call E-government then? *'E-government means the knowledge-based transformation of the public sector relationship system and the streamlines, service-oriented reorganization through the public utilization of info-communication technology applications.'* (Budai, 2014, 13.). There are three basic elements in the definition that help to understand the concept of E-government. Thus, the knowledge-based transformation of the relationship system. In this case think of the information society, which is a kind of knowledge-based society, in which knowledge management and learning organization play a significant role. The second pillar is rationalized, serve-type reorganization, this definition can be paired with service-providing and efficient state, and public management approaches are also reflected in this definition. The third pillar is the public use of info-communication applications, which means nothing more than multi-channel, electronic and automated administration by the means available in the information society. The toolbox of E-government will be able to change and evolve at an accelerating pace, allowing for new, simpler planning, decision-making, organization, management, and control mechanisms through the reforms to be introduced. Without these, the administration will not be able to keep pace with the trend of social and economic modernization.

Figure 2: *Advantages and disadvantages of E-government*



Note. Created by the author.

The Appearance of E-Government in the Field of Disaster Management

E-government means more than the public administration websites on the Internet (Czékmann & Csáki-Hatalovics, 2019, 15-23.). The development of E-government has brought with it the fact that the technologies, processes and regulations and conditions governing the work of the organization used in the field of disaster management are undergoing a constant wave of change. The complexity of this transformation process requires knowledge-based operation, without which the process would be unthinkable. We think only of knowledge management as its purpose and knowledge to the right person at the right time, in the right way and form.

In the past few years, a rapid growth has begun due to the tendency to legislate in the European Union and the increasing pressure on the market as driving force. The wave of change in E-government has this brought significant changes for the disaster management as a special field of public administration. The changes include the replacement of the usual paper-based filing habits with electronic ones, the introduction of paperless administration for those obliged to communicate electronically. It also includes the possibility for natural persons to

choose the method of electronic communication during the proceedings. Data processing programs also provide a kind of electronic interface for the statistical processing of data. The development is visible, although not yet complete, as both the data required for data recording programs and the materials to be archived include many basic paper-based documents, the digitization of which enables other progresses of work to be performed on the electronic interface. Act CCXXII of 2015 on the general rules of electronic administration and trust services, in accordance with the provisions of the Act (URL2), the professional disaster management authorities will provide customers with the possibility of electronic administration from 1 January 2018. In my opinion, it is necessary for users, as customers, that E-government, including disaster management, strives to develop electronic administration interfaces which make customers satisfied with the simplicity and efficiency of the service management interface. Meaning if they are implemented on a very complex, impenetrable surface, the citizens may feel discouraged from E-government, which will lead to unsuccessful ways in achieving the goals of the information society itself. Based on the above, we can determine that the implementation of E-government in the field of disaster management organizations must be examined and ensured from two directions. One is of the units within the organization, i.e., through tools and programs that improve the effectiveness of the authority's work. The other is through communication between customers and disaster management, and through an efficient interface for administration.

Based on the fourth wave of the industrial revolution and the development trend of the information society, the professional disaster management departments use a number of electronic programs, software and tools in their work in order to make disaster prevention, protection and damage elimination as effective as possible. Although the performance of the IT tools used by the departments is in line with the development of the present age and the emerging tasks, certain circumstances. These circumstances include but are not limited to labour shortages, young staff, increasing number of facilities to be inspected for security, change in living conditions, being constantly updated for both software and hardware, in particular the increased resource requirements of constantly updates GIS databases. The electronic software and devices used must be stable and reliable as integrated info-communication tools. Of the IT tools and software used by many specialties and organizational units, the author presents only the description of the employees employed by the official departments in the course of their professional work.

The official departments of the branches and directorates manage the Official Data Reporting System, i.e., HADAR (Hatósági Adatszolgáltatási Rendszer),

with regard to inspections and related official procedures. The purpose of the system is to make the audits searchable in the system, to make it possible to trace the procedural actions kept in the case of each audit, as well as the deficiencies discovered in them and the sanctions applied to them. The system operated as part of the Online KAP system (Közös Alkalmazási Platform – Common Application Platform), which contains even more information, thus assisting the administration. The system also includes a map interface on which the exact location and name of the facility under control and the data of the headquarters and site can be recorded. The disadvantage of the map interface is that it is not able to communicate with the company register, which is considered to be public, from which it would be important for the facilities to transfer and record data even directly. In accordance with data protection legislation, data identifying natural and legal persons may also be included, which would also serve efficiency.

RoboCop NEO, as an integrated business and case processing electronic records management system, serves those performing official tasks to perform administrative tasks. The RZS Signer module is connected to the interface of the RoboCop NEO, with the help of which the system has become able to make a certified electronic copy of paper-based documents. This is necessary in the case of paper-based documents submitted during official work, as well as in the case of all recorded protocols, as this is also a program related to the E-government deployment method. The system of RoboCop NEO is used to file official cases by case type, and it also ensures that all incoming and outgoing documents in the case are recorded by sub-number for each main number. Official staff can see the procedural deadlines set according to the procedural rules for the given case type, the observance of which is a primary consideration. With regard to official matters, the on-site inspection and inspection reports are also uploaded here in a separate sub-section. The protocols are paper based, they are filled in manually at the inspection site and the digitalized using the RZS Signer module. Once official cases have been closed, archiving will take place and documents will remain digitally retrievable.

During the performance of its tasks, the authority also uses the Official Gate (Hatósági Kapu – HKP) system, which operates as part of the Central Electronic Service System, in order to maintain official contact with the parties specified in the legislation on electronic administration. Through this system, recipient organizations can receive their electronic messages in an authentic manner, and electronic messages sent by agencies can be sent to identified customers, such as citizens, agencies, and businesses, in the same way. The E-paper application is also connected to the system, which is also an authenticated messaging

application that can connect customers to the institutions connected to the service electronically via Internet connection. In order to use this service, the customer must have a customer gateway (ügyfélkapu). The two services and application described above are part of the office gateway and E-paper is part of the customer gateway. The task and purpose of the government's electronic identification system is to provide users with the opportunity to communicate with authorities providing electronic public administration and services after a controlled entry. The existence of these programs is also an important stage in the development of E-government and contributes to the digitalization of the official activities of disaster management authorities themselves.

With regard to official proceedings, the new Procedural Act is governed by Act CL of 2016 on General Administrative Procedure. Act introduced significant changes for non-compliant natural and legal persons, as, unlike the previous regulation, the National Tax and Customs Office was designated as the authority for uniform and general enforcement. The authorities initiating the implementation, such as the disaster management authorities, were able to start the procedure by filling in the appropriate form on the basis of the official/client gateway access through the General Form Filling Program (Általános Nyomtatványkitöltő Program – ÁNYK) set up for this purpose as a general form filling program. From January 2020, the National Tax and Customs Office launched 'VKAPU', its IT system for handling the submission of recovery requests, which will serve as the initiating interface for the enforcement instead of General Form Filling Program.

Use by disaster management users, facilitating use, and enforcing 'ÉTDR' (Építési hatósági engedélyezési eljárásokat Támogató elektronikus Dokumentációs Rendszer – Electronic Documentation System Supporting Building Authority Licensing Procedures) as a building requirement (Érces, Ambrusz, 2019, 45-83.). This system is the E-government service that allows for the electronic submission of applications and plans, as well as the electronic case management in the above-mentioned official authorization procedures. Electronic files received through both the 'ÉTDR' and the 'HKP' system, upon receipt, are subject to the provisions of Decree 335/2005 (XII. 29.) on the general requirements for the record management of authorities performing public tasks. From administrative point of view it is managed by the central organization of disaster management. Due to the emergence and develop processes of E-government, the IT systems supporting the work of the authorities have undergone a lot of development. In my opinion the above systems are adequate, but if they were further developed or supplemented, they could become even more efficient.

Possibilities of Application of Iot in the Field of Authority

I have brought up that a modern industrial revolution is going on around us and how important E-government is in building smart city, smart country concepts. I have introduced the concept of IoT, the Internet of Things, in which I have found that more and more of these tools are used by us and that their number and refinement are increasing significantly. In my opinion, the possibilities of using these devices in the course of disaster management authorities have significant potential. We can only think that these devices are always connected to a well-defined, i.e., physically appearing object, or that when the devices are connected to the Internet, they can form a network that can be accessed from anywhere. The network will thus apply not only to connecting people, but also to the structure of things and devices. The point, as defined, is to communicate with each other in the name of efficiency, speed, and expediency. The system-level installation of fire alarms, but in some cases fire extinguishers and other special fire protection devices (heat and smoke extraction equipment, fire protection closures, etc.), is becoming more and more typical nowadays, especially for newly built facilities. These devices are given smart features, so they have the possibility of communication faster and more precise. The disaster management authority has a significant role in prevention, as it acts as a specialist authority for the construction and commissioning procedures for these facilities. Then it can carry out its activities under continuous control and supervision.

In any case, the main aim should be to prevent a fire or other disaster, such as an outflow of hazardous substances, and to maximize the speed of signalling and intervention in the event of an accident. In order to achieve these goals, it is also necessary for the authority to use IoT devices as widely as possible. *'The capabilities of IoT technologies are perceived as the inputs to the smart disaster governance system, whereas disaster governance functionalities were marked as the system activities.'* (Shahat, Hyun, Yeom, 2020, 14.). It can also be made available through the integration of on-site security equipment, like the use of modern high-resolution and other cameras with special capabilities, such as heat detection, can also significantly improve the release of fire and hazardous material from technological devices in early detection (Szakál, Címer & Kátai-Urbán, Sárosi & Vass, 2020, 175.). Based on the algorithms running in the background, the cameras as IoT devices can be paired by the appropriate application to build a system with a sensitivity that exceeds the accuracy of the sensors. Continuous images provided by the cameras can give important information not only to those who may be on site or in remote monitoring centres, but also to disaster management personnel or the fire brigade itself after

transmission to protected systems. Even at the start of the march until arriving, with the help of live images from the camera system, the unit commander can prepare its team for effective intervention. With regard to the live viewing of the image of the camera systems installed in the facilities, there is access to a tablet available to the intervention staff on site, which would display all the fire and other safety devices related to the facility in addition to the camera system for remote control of the devices. It would be worthwhile to build most of this type of protection equipment in the future in a dual way, even on the basis of wireless technology. In these cases, the possibility of a significant heat effect of fire and damage by hazardous materials can be filtered out. The on-site use of the camera system, as well as the smartening of the built-in fire alarm and other safety devices can also facilitate the work of the authorities. Just think of connecting to the network of fire protection and safety devices with a tablet application for the inspection authority. Name, location, functionality of the device, the name of the person performing maintenance, the certificate of education, the time of maintenance and inspection could be included. An application that would be installed on today's smart phones and thus all the fire-fighting technical devices to be used in that facility in the event of a possible fire or spill of hazardous substances, such as a fire extinguisher, would also increase the activity of the authorities and the safety of the persons in the facility themselves. So, appliances, devices for fire ignition keys in place, security doors and closing valves of escapes would be marked. There would be no significant cost in smartening manual starters, fire extinguishers, safety devices, as it could be solved with a simple chip to send the location and name to the system.

The application could be useful, as these devices could be found even in smoke or in low light conditions. Another advantage of using this would be that thanks to the mobile's accurate positioning system, one could see where to go and how far the nearest device is. The application would help the escape of the person(s) trapped inside by mapping the shortest and safest escape route. The advantage of the app would be that it communicates, also giving voice instructions to help those who are disabled in some way, such as the blind or visually impaired. In addition, after opening the program, in case of a possible danger, the program sends information about their situation to the centre. This can be displayed on the means available to the intervention staff, so that they can identify the exact location of the person inside. In addition to smart phones, the application could be used on other devices that are now commonplace, such as smart jewellery and watches.

Thanks to the current level of Industry 4.0 and the significant digital technological advances it has brought with it, Virtual Reality (VR), Augmented Reality

(AR), Mixed Reality (MR), and Extended Reality (XR) have reached a high level of usability. The invention of technology is not new, as the creation of virtual reality dates back almost fifty years. The key point is the increase in the number of services and uses, as well as their widespread availability. In the case of these technologies, the role of 3D objects and artificial intelligence should be emphasized. Virtual Reality (VR) is an immersive experience also known as computer simulated reality. It refers to computer technologies that can be used to create realistic sounds, images, and other feelings for the users. They recreate, replicate the real environment, or create a non-existent imaginary world. With VR, users can immerse themselves in a completely virtual world. A true VR environment includes all five senses (taste, sight, smell, touch, sound), but this is not always possible to achieve.

Augmented Reality (AR) is a live, direct, or indirect image of a physical, real-world environment whose elements are complemented by computer-generated sensory input, such as audio, video, graphics, or GPS data. (Sangmin, Soung & Lee, 2018, 8.) As AR exists at the top of our own world, it builds on the real world we see as a kind of layer. AR takes advantage of its existing reality and complements it by using some tools. Mobile phones and tablets are the most popular media of AR, with applications overlapping digital content into the environment through the camera. The collective concept of extended reality is XR, which includes all VR, AR, and MR technologies. Areas of application of the technology include but are not limited to critical infrastructure protection and disaster management at an organizational level. Extended reality can appear in the daily work of firefighters, for instance, by incorporating an AR device into the helmet, which provides the firefighter with information described in the previous chapter. Information could be the location of firefighting technical devices, utility openings and closures. It can serve as an effective complement to information about people inside, and intrusion point, and team communication tools. For disaster management authorities, VR and AR can appear at each stage, for instance, in the case of building permit procedure, the submitted plans can be digitally modelled using VR technology to walk around the facility both from outside and inside, room by room. Also, the place of the later-to-be-installed firefighting facilities becomes verifiable, thanks to virtual reality. When in use, AR technology can provide important information, as the location, technical and other information on the structure of the building as indicated in the documentation submitted during the previous permitting procedure may appear here. Walking around with XR can be more efficient and effective, as in this case a possible construction or establishment not according to the design documentation can be revealed immediately. The VR may assist less experiences regulatory

professionals in simulating the inspection before performing it on site of the inspected facility. With this, the location can be known from the office, and during this the fire protection history related to facility could also be seen. AR technology could facilitate fast and efficient work in all aspects. It would provide its users with additional information during inspections that van guarantee the process of a procedure, but most importantly the safety of the facility.

Conclusions

This article seeks to establish a basis on the above theoretical level. In this context, in my opinion, supplying firefighting technical equipment with a smart chip could replace paper-based inspection and maintenance documentation. Also, a review tool could easily check the official control authority using a tablet in a five- to ten-year horizon. The application of the info-communication tools and solutions described above in all areas of disaster management is expected to increase efficiency itself. Its measurement involves further development opportunities. In the case of public administration and disaster management itself, and in particular the research topic, further development of official work could be achieved by developing an official application described in a following article. It should be endowed with simple, fast, efficient, accurate, up-to-date and transparent features, as well as the technical properties of the tablet to be used for this application have to be met.

References

Budai, B. (2014). *Az e-közigazgatás elmélete (második, átdolgozott kiadás) [Theory of E-government]*. Akadémiai Kiadó

Czékmann, Zs. & Csáki-Hatalovics, Gy. B. (2019). Az elektronikus közigazgatás fogalma [The Concept of E-government]. In Czékmann, Zs. (Eds.), *Infokommunikációs Jog* (pp. 15-23). Ludovika Egyetemi Kiadó

Endrődi, I. & Teknős, L. (2014). New possibilities of emergency communication and information in the protection phase of disaster management. *Academica Applied Research in Public Management Science 13*(2), 235-249.

Érces, G. & Ambrusz, J. (2019). A katasztrófák építésügyi vonatkozásai Magyarországon [Construction Aspects of Disasters in Hungary]. *Védelem Tudomány 4*(2), 45-83.

Haig, Zs. (2018). *Információs műveletek a kibertérben [Information Operations in Cyberspace]*. Dialog Campus Kiadó, 97-98.

Kagermann, H., Wahlster, W. & Helbring, J. (2013). *Securing the Future of German Manufacturing Industry: Recommendations for Implementing the Strategic Initiative Industrie 4.0.* Final report of the Industrie 4.0 Working Group. Forschungsunion im Stifterverband für die Deutsche Wirtschaft e.V.

Lakatos, B. & Teknős, L. (2019). Az „új" eljárási törvény eddigi, valamint a jövőben hatályosuló szankció törvény várható hatása a hivatásos katasztrófavédelmi szervek hatósági tevékenységére [The Expected Impact of the 'New' Procedural Law so far, as well as the Sanction Law in Force in the Future, on the Official Activities of Professional Disaster Management Bodies]. *Védelem Tudomány, 4*(4), 167-180.

Munk, S. (2007). *Katonai informatika a XXI. század elején [Military Informatics at the beginning of the 21th Century].* Zrínyi Kiadó, 9.

Nemeslaki, A. (2018). A magyar közigazgatás digitális transzformációjának jelentősége a vezetéstudományban: beköszöntő a tematikus számhoz [The Significance of the Digital Transformation of the Hungarian Public Administration in Management Science: An Introduction to the Thematic Issue]. *Vezetéstudomány, 49*(7-8), 2-5. https://doi.org/10.14267/VEZTUD.2018.07-08.01

Sangmin, P., Soung, P. H. & Lee, P. W (2018). Design and Implementation of a Smart IoT Based Building and Town Disaster Management System in Smart City Infrastructure. *Applied Sciences, 8*(11), 2239. https://doi.org/10.3390/app8112239

Shahat, E., Hyun, CT. & Yeom, C. (2020). Conceptualizing Smart Disaster Governance: An Integrative Conceptual Framework. *Sustainability, 12*(22), 9536. https://doi.org/10.3390/su12229536

Szakál, B., Címer, Zs., Kátai-Urbán, L., Sárosi, Gy. & Vass, Gy. (2020). *Módszertani kézikönyv a veszélyes anyagokkal kapcsolatos súlyos balesetek elleni védekezéssel foglalkozó gyakorló szakemberek részére [Methodological Manual for Practitioners Dealing with the Prevention of Major Accidents involving Dangerous Substances].* Hungária Veszélyesáru Mérnöki Iroda, 175.

Teknős, L. (2018). Exploring the Possibilities of Citizen Preparation for Extreme Weather Events – an International Outlook. *Hadmérnök 13*(4), 241-260.

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URL3: *335/2005. (XII. 29.) Korm. rendelet a közfeladatot ellátó szervek iratkezelésének általános követelményeiről [Decree 335/2005 (XII. 29.) on the general requirements for the records management of authorities performing public tasks from administrative point].* https://njt.hu/jogszabaly/2005-335-20-22.38

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Lakatos, B. (2021). Investigation of Smart Tools in Order to Improve the Effectiveness of the Administration of Disaster Management I. *Belügyi Szemle*, *69* (SI1), 142-157. https://doi.org/10.38146/BSZ.SPEC.2021.1.8