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New challenges of local and regional public service provision: platforms and their cybersecurity issues

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Abstract

Public service provision and administration have been transformed by the digitalization and application of information and communication technologies (ICT). My paper will focus mainly on the impact of these changes on the service provision and on the cybersecurity issues. The new, general systems offer a more efficient service provision but it has several, non-primarily perceived impacts. First of all, the 'platformisation' of the local services could be interpreted as a new form of centralization. These platforms are either managed by the central government or the data for the local and regional managed platforms are provided by the central government. The approach of the data management and the data provision has a standardisation, and thus a centralisation effect. The centrally managed platforms and the interface between local and central system has

even cybersecurity issues: these interfaces, and especially the local systems could be vulnerable to cyberattacks.

Keywords: centralization, decentralization, digitalization, public service provision, cybersecurity

Introduction

In the developed democratic states, the administration and management of local public affairs is inconceivable without local self-governance. Local and regional governments and the services provided by them have a significant impact on the structure of the public administration of a given country. It should be emphasised that the development of information and communication technologies (ICT) resulted a significant change in administrative activities, which transformation impacted the centralization of administrative tasks.[1] This change is significant, because the main elements of the alteration of the system are quite latent, but these modifications can be interpreted as a 'silent revolution' of the local and regional public service provision.

As it has been mentioned later, the platforms as tools of e-governance can be observed in most of the countries, even the administrative systems of the developing countries use the platforms as a tool for performing and managing public administration.[2] However, the evolvement of e-governance and the even extensive application of platforms could be considered as a global phenomenon,[3] but there are differences between the countries and between their approaches. In my paper, I would like to focus on the general elements of this platformisation, but my analysis will partially focus on the approach and system of the Visegrád countries, especially Hungary. These countries have an interesting situation. First of all, they are Member States of the European Union, and therefore they should follow the EU regulation on the protection of critical infrastructure. Secondly, they are

[1] I. Hoffman et al., *New Ways of Providing Public Services: Platforms of Service Provision and the Role of Artificial Intelligence: in the Light of the Development of the Hungarian Public Administration*. In: S. Benković et al. (Eds.), *Digital Transformation of Financial Industry. Approaches and Applications*, Springer, Cham, 2023, pp. 187.
[2] Y. Shen et al., *From recovery resilience to transformative resilience: How digital platforms reshape public service provision during and post COVID-19,* „Public Management Review" 25 (4), 2023, pp. 712-714.
[3] S. Kim et al., *Platform Government in the Era of Smart Technology,* Public Administration Review 82 (2), 2022, pp. 363-365.

developing their e-governance systems, and they try to use the e-governance as a tool for economic development, as well. Last, but not least, especially Hungary has been introduced obligatory application of e-services and administrative platforms for several legal subjects in the last two decades, therefore, the evolvement of these systems is strongly supported by the legislation and by central government policies.[4]

Methods

My paper is based on a jurisprudential analysis. First of all, I would like to analyse the models and paradigms of the municipal systems, because the municipal e-administration is part of the municipal policies. These policies are strongly influenced by the given municipal systems. The examination will focus on the public service provision. The platforms as centralised and standardised systems are more effective than the fragmented e-systems, but based on this concentration, several vulnerability threats could be observed. Therefore, the cybersecurity issues of the local platforms will be analysed.

However, the major method of the analysis will be jurisprudential. Similarly, the policies on e-local government will be reviewed shortly.

Platforms and public administration

It is emphasised by the literature that that platforms can be approached from several angles: firstly, as a specific product development outcome, secondly, as a specific technological strategy, and thirdly, as an industrial economic phenomenon.[5] Platforms can also be analysed as a specific network, typically connected to the Internet, and as a specific ecosystem. Platforms are interpreted by the market theory as both a network interface connecting two groups and a system that creates value through a common architecture. The interpretation of technology management approach is based on the network nature of the platforms. It is emphasised by this approach that they are standardised ecosystems which are highly interconnected and systemised. Strategic

[4] A. Bencsik, M. Karpiuk & N. Strizzolo: *Information Society Services and Their Cybersecurity,* „Cybersecurity and Law" 11 (1): 258-270 (2024), pp. 262-266.
[5] Y. B. Carliss & C. J. Woodard: *The architecture of platforms: a unified view.* In A. Gawer (ed.): *Platforms, Markets and Innovation.* Edward Elgar, Cheltenham (UK) – Northampton (MA, USA), 2009. p. 19-20.

management looks at the corporate operation of the platform as a network and the system of processes that create value. On the one hand, the best-known platforms are systems linked to the provision of services, such as various data analytics platforms. However, the role of platforms is much broader than that: in fact, modern corporate governance relies extensively on these solutions, which are standardised and easily adaptable to the company's own processes and to other companies' systems. In this context, I would like to highlight the different enterprise performance management systems, for example the SAP system as an example of a widely used solution. It should be emphasised that the above-mentioned platform definitions are also applicable to the analysis of public administration activities.[6]

Because of the widespread application of platforms, they have also become strongly embedded in the regulatory issues of public administration. Public attention has focused primarily on the regulation of the above-mentioned platforms which are based on the sharing economy. However, the infocommunications revolution has also had a significant impact on the activities of public administrations, and the emergence of e-government has been influenced by platforms.[7]

It is undeniable that the digital revolution has now reached public administrations. E-government brings many benefits. For example, customers are not bound by office hours, they do not have to meet officials, they have easier access to information and a range of tools to help them make decisions. E-government is an umbrella term: in the literature it is used to describe government innovation and government information and services. The goal of e-government is often defined as paperless offices, meaning that electronic administration transforms paper-based processes into electronic processes. E-government creates many ways for governments and citizens to communicate with each other. As a result, customers have become actors in the administrative system.[8] Therefore, eGovernment is a tool for economic development. Simplified procedures and

[6] A. Hein et al., *Digital platform ecosystems,* "Electronic Markets" 30. (2020), 87-98. p. 87-89.
[7] E. Vasilieva, *Digital Public Service Platforms: Challenges and Opportunities.* In: E. Zaramenskikh et al. (eds): *Digital Transformation and New Challenges. Lecture Notes in Information Systems and Organisation, vol 40,*) Springer, Cham, 2020. pp. 13-16.
[8] Kim et al., *op. cit.* pp. 362-364.

automation of decision-making can speed up procedures, which in turn can lead to a reduction in administrative costs. Therefore, the literature considers investment in e-government as an investment in economic development. Taking into account the impact and results of platforms in economic life, some public administrations have also started to adopt platform-like solutions relatively early, at the turn of the millennium. In the Hungarian public administration, systems have also emerged that ultimately fit different descriptions of platforms: thus, the general government electronic administration system, the Customer Gateway, and, closely related to it, the Central Identification Agent can be clearly described as such a specific network and ecosystem.[9]

If we look at the development of the European systems, we can point out that platform-like solutions were the first and most widespread in the field of financial administration, mainly in the area of public revenue management and payment.[10] Later, several such administrative sector solutions were developed, including those related to public revenues, for example in the field of social security and construction administration. Various platforms have also been developed in other areas of traditional public administration. Platform-like solutions have also appeared in the area of property registration, such as the electronic land registry system and the vehicle locator. The range of these platforms for registration has been continuously expanding in recent years. These platforms were essentially related to administrative-public authority functions, i.e. traditional public authority administrative activities, including public authority enforcement and, to some extent, public authority supervisory activities.[11]

Public administrations also provide a wide range of public services. Given that economic platforms have been particularly successful in the field of services, it is logical that these solutions have also been introduced in the field of public services in the various public administrations. These platforms for service information and administration have also appeared in the public services organised by the Hungarian public administration. Thus,

[9] Hoffman et al., *op. cit.* pp. 184-188.
[10] A. Drigas et al., *Government Online: An E-Government Platform to Improve Public Administration Operations and Services Delivery to the Citizen*. In: M. D. Lytras *et al.* (eds.) *Visioning and Engineering the Knowledge Society. A Web Science Perspective,* Springer, Berlin & Heidelberg, 2009. p. 523-532.
[11] Vasilieva, *op. cit.* pp. 14-18.

in the field of social security services and, in particular, health services, such solutions have already been developed at the turn of the millennium. These systems have been adapted several times and the services they provide and the data they handle have been continuously extended. The role of these health service platforms has been increased during the COVID-19 pandemic, because it could offer the possibility of telemedicine and thus to decrease the personal interactions and the risk of infections.[12] Similarly, the COVID-19 pandemic has brought to the fore platforms in the field of education. The first platforms in higher education have been developed during the Millennia. The higher education has been internationalised even in the field of platforms, major systems (for example Coospace, Canvas, Moodle and kahoot!) have been developed and they are widely used by the different higher education systems. The individual university systems were based on these engines. During the 2010s, based on the classroom and on-line conference management systems, the universities have built systems which are integrated with these conference and classroom engines (for example Zoom, Webex and the MS Teams). These systems have been widely used by universities during the different emergency situations of the polycrisis of the 2020s.[13]

Platforms as a tool of 'stealth centralisation'?

The latent, 'stealth' centralisation has also taken on 21st century forms. With the informatics 'revolution', the widespread application of ICT and the emergence of the information society, information and data related to public services are becoming increasingly important. In the majority of the developed countries, these data systems and platforms are generally organised by the central government. Since without this data, the new types of public service organisation solutions for local authorities, which are extensively based on digital solutions and which in many cases are linked to the smart city concept, cannot be implemented or can only be implemented to a limited extent, the ownership of and access to data has also led to a kind of centralisation in these countries, which is only indirectly perceived at first sight. This centralisation is similar to the above-

[12] D. M Mann et al., *COVID-19 transforms health care through telemedicine: Evidence from the field, "Journal of the American Medical Informatics Association"*, 27 (7), 2020, pp.1132-1135.
[13] V. Shevchenko at al., *Distance Learning in Ukraine in COVID-19 emergency,* "Open Learning: The Journal of Open, Distance and e-Learning", 39 (1), 2024, pp. 5-7.

mentioned transformation of the business sector: the introduction of corporate digital ecosystems – for example, one of the most known is the System Applications and Products in Data Processing (hereinafter: SAP), which is the leading software in Enterprise Resource Planning market[14]– resulted the centralisation of the company management and the standardisation of the different corporate procedures and activities[15]. The corporate ecosystem of the multinational companies has been more centralised after the introduction of these platforms because the former differences in procedures and management have been disappeared.[16] The impact of the ICT on public service is similar to the digital transformation of the business sector. However, these alterations are quite visible, the digital transformation is the 'stealthy' one, but the evolvement of the public service provision platforms could be interpreted as a very real and significant centralisation. This latent centralisation is also evident in Australia.[17]

Cybersecurity and platforms

Cybersecurity became an important issue of the municipal administration after the Millennials, especially after 2010, when the eGovernment and the municipal e-services begun to evolve rapidly.[18]

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. These regulatory issues were accelerated by significant cyberattacks and the experiences of these attacks and the defense against them. Mainly centrally supervised systems have been regulated.

[14] T. Leimbach, *The SAP Story: Evolution of SAP within the German Software Industry,* "IEEE Annals of the History of Computing" 30 (4), 2008, pp. 62-64.
[15] A. Hein et al., *Digital platform ecosystems,* Electronic Markets: 30, 2020, pp. 88-90;
J. Kostrubiec, *Preventing the Abuse of the FinTech Sector for Money Laundering and Fiscal Fraud in Terms of Polish Law: Legal Measures and Postulates of Normative Changes,* [in:] S. Benković et al. (eds.), *Digital Transformation of Financial Industry. Approaches and Applications*, Springer, Cham 2023. p. 192.
[16] F. Ludacka et al., *Digital Transformation of Global Accounting at Deutsche Bahn Group: The Case of the TIM BPM Suite*, In: J. von Brocke et al. (Eds.), *Business Process Management Vol 2. Digital Transformation- Strategy, Processes and Execution*, Springer, Cham, 2021, pp. 58-61.
[17] R. Tomlinson, *The failure to learn from others: vertical fiscal imbalance, centralisation and Australia's metropolitan knowledge deficit,* Austrialian Journal of Public Administration, vol.78 (2), 2019, pp. 218-221.
[18] M. Czuryk et al., *The legal status of local self-government in the field of public security*, "Studia nad Autorytaryzmem i Totalytaryzmem", 41 (1), 2019, pp. 34-36.

It should be emphasised that the major challenges of the municipal cybersecurity are linked to nationally defined requirements. Especially in those countries which have fragmented municipal systems, and the number of the local offices are quite high, the local offices are quite small. These offices have often lack of resources and lack of human capacities, especially in the field of cybersecurity.

The majority of the civil servants of the municipal offices have limited training in the field of cybersecurity, even in larger, urban municipalities.[19] It should be emphasised, that not only the lack of resources for a more developed cybersecurity defence hardware and software is a major element of the vulnerability of the municipal systems.[20] Another threat of these system is the human factor.[21] Those municipal officers who have not been trained on avoiding cyberattacks based on the inexperience of the platform users could be a significant threat on these centralised platforms, as well. It is emphasised by the literature, that one of the most significant vulnerability factors of these systems are the human users, because their inexperience could result in large scale cyberattacks, as well. Similarly, the increasing number of the users and interfaces result an increasing threat on these systems. Therefore, those general systems which are linked to the municipal systems and have a large number of users have a more significant risk of vulnerability. [22] 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 fragmented systems, because they are more vulnerable than the national(ised) systems.[23] Similarly, the university systems could be considered such a vulnerability because of the great range of interfaces and users.[24] Thus, the central governments have significant tasks in

[19] B. Preis et al., *Municipal Cybersecurity: More Work Needs to Be Done,* „Urban Affairs Review" 58 (2), 2022, pp. 620-624.
[20] *Idem,* pp. 621-623.
[21] V. Dutt, Y-S. Ahn et al., *Cyber Situation Awareness: Modeling Detection of Cyber Attacks With Instance-Based Learning Theory,* „Human Factors", 55 (3), 2013, pp. 607-609.
[22] M. Ovelgönne et al., *Understanding the Relationship between Human Behavior and Susceptibility to Cyber Attacks: A Data-Driven Approach,* "ACM Transactions on Intelligent Systems and Technology", 8 (4), 2017, pp. 17-20.
[23] I. Hoffman et al., *The local self-government's place in the cybersecurity domain. Examples of Poland and Hungary,* "Cybersecurity and Law", 7 (1), 2022, pp. 184-186.
[24] C. Melchior et al., *Security of Personal Data in Cyberspace in the Opinion of Students of the University of Udine*, "Cybersecurity and Law", 11 (1), 2024, pp. 232-235.

strengthening the municipal cybersecurity. And as it can be seen, it is not enough to issue legislative and regulatory acts, but even the local trainings should be supported by the central government. Because of these centralised platforms, the municipal cybersecurity is not only a local issue; it has significant impact on the national systems, as well.[25]

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 regulation on e-Government and on the digitalisation of the public administration transformed significantly. The regulation was focused on the development a horizontally integrated e-administration. The municipal e-administration systems have been built by the municipalities (especially by the larger municipalities), but their operation could be developed. The regulation and the supervision activities of e-Government are detailed regulated and have evolved quickly during the last years, and its focus have been partly transformed. Not only the individual decisions, but even the provision of public services have become digitalised. The new, centrally operated platforms can be even interpreted as a ne, 'soft' tool of the centralisation.

Literature

Bencsik A, Karpiuk M. & Strizzolo N., *Information Society Services and Their Cybersecurity,* „Cybersecurity and Law" 11 (1): 258-270 (2024), https://doi.org/10.35467/cal/188446

Carliss Y. B., Woodard C. J., *The architecture of platforms: a unified view,* [in:] A. Gawer (ed.), *Platforms, Markets and Innovation,* Edward Elgar, Cheltenham (UK) – Northampton (MA, USA), 2009. pp. 19-44, https://doi.org/10.4337/9781849803311

Czuryk M., Kostrubiec J., *The legal status of local self-government in the field of public security,* "Studia nad Autorytaryzmem i Totalytaryzmem" 41 (1)33-47, 2019, http://dx.doi.org/10.19195/2300-7249.41.1.3

Drigas A., Koukianakis L., *Government Online: An E-Government Platform to Improve Public Administration Operations and Services Delivery to the Citizen,* [in:] M. D. Lytras et al. (eds.) *Visioning and Engineering the Knowledge Society. A Web Science Perspective. WSKS 2009.* Springer, Berlin & Heidelberg, 2009, pp. 523-532, http://dx.doi.org/10.1007/978-3-642-04754-1_53

[25] I. Hoffman et al., *E-Administration in Polish and Hungarian Municipalities – a Comparative Analysis of the Regulatory Issues* "Lex localis – Journal of Local Self-government", 20 (3): 2022, pp. 633-637.

Dutt V, Ahn Y-S. & Gonzalez C., *Cyber Situation Awareness: Modeling Detection of Cyber Attacks With Instance-Based Learning Theory,* „Human Factors" 55 (3): 605-618 (2013), https://doi.org/10.1177/0018720812464045

Hein A. et al., *Digital platform ecosystems,* "Electronic Markets" 30: 87-98 (2020), https://doi.org/10.1007/s12525-019-00377-4

Hein A., Schreieck M., Risanow T., Setzke D. S., Wiesche M., Böhm M, Krcmar H., *Digital platform ecosystems,* "Electronic Markets" 30: 87-98. (2020) http://dx.doi.org/10.1007/s12525-019-00377-4

Hoffman I., Bencsik A., *New Ways of Providing Public Services: Platforms of Service Provision and the Role of Artificial Intelligence: in the Light of the Development of the Hungarian Public Administration*, [in:] S. Benković, A. Labus, & M. Milosavljević (Eds.), *Digital Transformation of Financial Industry. Approaches and Applications* (pp. 171-190), Springer, Cham, 2023. https://doi.org/10.1007/978-3-031-23269-5_10

Hoffman I., Karpiuk M., *The local self-government's place in the cybersecurity domain. Examples of Poland and Hungary,* "Cybersecurity and Law" 7 (1): 171-190. (2022), http://dx.doi.org/10.35467/cal/151826

Hoffman I., Karpiuk M., *E-Administration in Polish and Hungarian Municipalities – a Comparative Analysis of the Regulatory Issues* "Lex localis – Journal of Local Self-government" 20 (3): 617-640 (2022), https://doi.org/10.4335/20.3.617-640(2022)

Kim S., Andersen K. N. & Lee J., *Platform Government in the Era of Smart Technology,* Public Administration Review 82 (2): 362-368 (2022), https://doi.org/10.1111/puar.13422

Kostrubiec J., *Preventing the Abuse of the FinTech Sector for Money Laundering and Fiscal Fraud in Terms of Polish Law: Legal Measures and Postulates of Normative Changes*, [in:] S. Benković, A. Labus & M. Milosavljević (Eds.), *Digital Transformation of Financial Industry. Approaches and Applications* (pp. 191-201), Springer, Cham, 2023. http://dx.doi.org/10.1007/978-3-031-23269-5_11

Leimbach T., *The SAP Story: Evolution of SAP within the German Software Industry,* "IEEE Annals of the History of Computing" 30 (4): 60-76 (2008), http://dx.doi.org/10.1109/MAHC.2008.75

Ludacka F., Duell J., Waibell P., *Digital Transformation of Global Accounting at Deutsche Bahn Group: The Case of the TIM BPM Suite,* [in:] J. von Brocke, J. Mendling & M. Rosemann (Eds.), *Business Process Management Vol 2. Digital Transformation- Strategy, Processes and Execution* (pp. 57-68), Springer, Cham, 2021, http://dx.doi.org/10.1007/978-3-662-63047-1_5

Mann D. M, Chen J., Chunara R., Testa P. A, Nov O., *COVID-19 transforms health care through telemedicine: Evidence from the field*, "*Journal of the American Medical Informatics Association",* 27 (7): 1132-1135 (2020), https://doi.org/10.1093/jamia/ocaa072

Melchior C., Soler U., *Security of Personal Data in Cyberspace in the Opinion of Students of the University of Udine,* "Cybersecurity and Law" 11 (1): 227-247 (2024), https://doi.org/10.35467/cal/188451

Ovelgönne M., Dumitraş T, Prakash B. A.,Subrahmanian V. S. & Wang B., *Understanding the Relationship between Human Behavior and Susceptibility to Cyber Attacks: A Data-Driven Approach,* "ACM Transactions on Intelligent Systems and Technology" 8 (4): 1-25 (2017), https://doi.org/10.1145/2890509

Preis B., Susskind L., *Municipal Cybersecurity: More Work Needs to Be Done,* „Urban Affairs Review" 58 (2): 614-629 (2022), https://doi.org/10.1177/1078087420973760

Shen Y, Cheng Y. & Yu J., *From recovery resilience to transformative resilience: How digital platforms reshape public service provision during and post COVID-19,* „Public Management Review" 25 (4): 710-733 (2023), https://doi.org/10.1080/14719037.2022.2033052

Shevchenko V., Malysh N., Tkachuk-Miroshnychenko O., *Distance Learning in Ukraine in COVID-19 emergency*, "Open Learning: The Journal of Open, Distance and e-Learning" 39 (1): 4-19. (2024), https://doi.org/10.1080/02680513.2021.1967115

Tomlinson R., *The failure to learn from others: vertical fiscal imbalance, centralisation and Australia's metropolitan knowledge deficit,* "Australian Journal of Public Administration" 78 (2): 213-226 (2019), https://doi.org/10.1111/1467-8500.12387

Vasilieva E., *Digital Public Service Platforms: Challenges and Opportunities.* In: Zaramenskikh E. & Fedorova A. (eds): *Digital Transformation and New Challenges. Lecture Notes in Information Systems and Organisation, vol 40*. (pp. 11-23.) Springer, Cham, 2020. https://doi.org/10.1007/978-3-030-43993-4_2