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Digitization as a tool of e-government in selected public services of the state: international comparison of Slovakia and the Czech Republic

Peter PISÁR¹, Soňa PRIŠČÁKOVÁ², David ŠPAČEK³, Juraj NEMEC⁴

Abstract: E-government and digitalization have been representing a promising topic of public administration reforms for more than two decades, but still today it is widely discussed that the progress has been rather slow in some countries and various failures have occurred. This article extends existing research on the issue of digitization of key government services for citizens in the CEE environment and expands to the Slovak Republic. The purpose of the research is to examine selected areas of e-government, that is, the digitization of basic public administration services in Slovakia compared to the Czech Republic. It also provides an overview of the latest e-government evaluation benchmarking studies in CEE countries. It uses a flexible, simplified framework that seeks technology neutrality and focuses on the citizen-centered evaluation of e-government services which is not frequent in the existing literature. The results showed that Slovakia achieved a higher score when examining the level of digitization of key government services to citizens compared to the Czech Republic, which confirms the results of the examined studies in their individual subareas. Both countries have some reserves in several areas, and it is necessary to use the space to improve them, which they also commit to in their strategic documents. Subsequent research efforts on this issue should focus on expanding the research to other EU member states that were part of the former Eastern bloc.

Keywords: e-government, basic digital public services, comparison, CEE countries, Slovakia, Czechia

JEL: H8; O3

¹ Professor PhD, Matej Bel University in Banská Bystrica, Faculty of Economics, Tajovského 10, 975 90, Banská Bystrica, Slovakia, e-mail: peter.pisar@umb.sk. ORCID: 0000-0003-4898-2739

² Ing, Matej Bel University in Banská Bystrica, Faculty of Economics, Tajovského 10, 975 90, Banská Bystrica, Slovakia, e-mail: peter.pisar@umb.sk. ORCID: 0000-0002-8934-3522

³ Associate Professor PhD, Masaryk University, Faculty of Economics and Administration, Lipová 41a, Brno, Czech Republic, e-mail: david.spacek@econ.muni.cz. ORCID: 0000-0002-1389-1311

⁴ Professor PhD, Masaryk University, Faculty of Economics and Administration; Lipová 41a, Brno, Czech Republic and Matej Bel University in Banská Bystrica, Faculty of Economics, Tajovského 10, 975 90, Banská Bystrica, Slovakia, e-mail: juraj.nemec@umb.sk. ORCID 0000-0002-5881-7422

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Introduction

The ways in which governments and citizens collaborate and organize at the social and economic levels have changed during the recent decades, also because of the rapid evolution of digital technologies. The informatization of public administration has no competition or alternative in its ability to make significant progress in the functioning of public administration and public services. Public administration information technologies affect almost all public policies and almost all public administration entities. According to the OECD (2019), e-government means the full digitization of the public sector, which can set up the level of integration necessary to bring better digital services to businesses and people (OECD, 2019).

The issue of e-government services from the 1990s of the 20th century forms a specific area of public policies where an interdisciplinary approach in theory and practice is inevitable, especially because of the complexity regarding its aims, preconditions, and barriers (Androniceanu et al., 2020). Since e-government represents an alternative to traditional administrative and governance processes, its complexity also derives from the specifics of public administration and public services themselves (e.g., the executive nature of public administration and the requirements of the rule of law; the role and practice of political leadership; the multi-layered character of present governance systems, with more hierarchical and more autonomous subsystems of state administration at the local and regional levels that are harder to coordinate from the national level; contradictory aims of public management reforms; etc.) (Špaček, 2015). E-government is not about services provision alone, it also plays a role in strengthening digital literacy, digital inclusion, digital connectivity, and digital identity (UN DESA, 2020).

Most e-government projects fail because of poor implementation (Heeks, 2006) and insufficient attention paid to nontechnical barriers in e-government prior to its implementation. Although existing national organizational structures for the implementation of e-government are being modified in many European countries (Špaček, 2014), the progress toward full digital e-government services is still just moderate. Taking this into the account, governments should be encouraged to use digital technologies and data to improve the delivery of public services (OECD, 2019). Current European e-government policy documents (van der Linden et al., 2021) indicate a new e-government era after the COVID-19 pandemic. This has had a significant impact on the economy and society of the EU. It has significantly changed the role and perception of digitalization in our economies and societies and has accelerated its pace. It has also shown the decisive role that disruptive innovation and technology can play. It has intensified the use of public and private online services, putting pressure on the capacity of digital connectivity networks (DESI, 2021). The OECD (2019) study also stresses that investing in sound e-governance, policies, and know-how helped governments to be better prepared for the COVID-19 pandemic. It has boosted the digitalisation of the economy and society of the EU,

which includes how government services are delivered. According to the United Nations (UN DESA, 2020), the utilization of conventional e-government services is becoming more widespread as social distancing drives online interaction, but e-government platforms are also being used to manage the crisis through innovative ways. While shelter-in-place and quarantine restrictions have brought many normal economic and social activities to a halt, e-government has passed a stress test. The pandemic has created opportunities for e-government to serve the public in new and vital ways. However, it has also increased digital divides, as many among the poorest and most vulnerable in society lack access to digital government services and support.

As this is a relatively equal level of development of e-government in the Czech Republic and Slovakia, with different strategies and levels of centralization, a comparative approach is chosen. The theoretical contribution of the paper is a comparison of the e-government evaluation benchmarking studies in Central and Eastern Europe (CEE) countries. The practical benefit of the paper is the extension of existing research (Špaček et al., 2020) dealing with the level of digitization of key government services to citizens (G2C) of selected CEE countries about the Slovak Republic.

In the following sections, the paper is arranged as follows. Chapter 1 contains a review of the literature; Chapter 2 focuses on describing and explaining the methodological aspects of the paper; Chapter 3 discusses the research results achieved; the last part summarizes the conclusions of the article.

1. Literature review

In the literature in connection with the issue of e-government, mainly maturity models (stages from basic to advanced), which offer a way to evaluate e-government portals and benchmarking approaches that use these models. Maturity models and benchmarking approaches are relevant and accepted methods for evaluating e-government in theory and practice (Andersen and Henriksen, 2006; Laposa, 2017). The authors of Concha et al. (2012) are dividing models of maturity into several types. Government models are used by agencies to identify and improve the level of maturity of e-government. Holistic approach models help agencies examine the success of e-government. Evolutionary models of maturity are focused on the development of e-government, e.g., from immature to advanced e-government with improved quality. These models focus on various determinants, such as the maturity of the process, the object (i.e., the level of software sophistication) or the skills of the people (i.e., the ability to create knowledge and increase expertise).

In this paper, we focus mainly on evolutionary models of maturity used to measure the structural transformation of public services. From an academic point of view, some of the best-known models are Layne and Lee (2001) - one of the first models; Andersen and Henriksen (2006) (an extension of the model by Layne and Lee) - e-government should go beyond the real benefits that and focus more on reaching citizens in a more effective way. For example, a comparative study by Fath-Allah et

al. (2014) contains a comparison of 25 evolutionary models of e-government maturity, with several of the authors arriving at their model through a synthesis based on existing models. The application of these models took place mostly in the USA, China, UK, etc.

E-government benchmarking consists of comparing performance between nations or agencies (Heeks, 2006). Since 2012, the European Commission has been publishing annual eGovernment Benchmark studies, which focus on comparing the maturity of digital government services in the EU. The year 2020 marked 20 years of benchmarking the e-government development of the members of the UN. The Department of Economic and Social Affairs of the United Nations (UN DESA) has published the United Nations E-Government Survey. The 2019 Digital Government Index of the OECD represents a critical effort to translate the e-government policy framework into a measurement tool, with the aim to benchmark the progress of e-government reforms.

In the conditions of the CEE countries, as EU member states which were part of the former Eastern bloc, the application of evolutionary models of maturity found application thanks to benchmark studies by the European Commission, the United Nations, and the OECD. European Commission measures how members and some additional countries are performing in e-government by the set of eight life events in a biennial cycle. Table 1 contains an overview of the latest e-government evaluation studies by these institutions, including the CEE countries ranking.

**Table 1. An overview of e-government evaluation benchmarking studies
(CEE countries)**

	EC (van der Linden et al., 2021)	UN DESA (2020)	OECD (2019)
<i>Number of researched countries</i>	36 [EU27+]	193	33
<i>Dimensions</i>	<ol style="list-style-type: none"> 1) User-centricity 2) Transparency 3) Key activators 4) Cross-border mobility 	<ol style="list-style-type: none"> 1) The adequacy of telecommunication infrastructure 2) The ability of human resources to promote and use ICT's 3) The availability on online services and content 	<ol style="list-style-type: none"> 1) Digital by design 2) Government as a platform 3) Data-driven public sector 4) Open by default 5) User-driven 6) Proactiveness
<i>Index</i>	<i>Digital Economy and Society Index (DESI)</i>	<i>E-Government Development Index (EGDI)</i>	<i>Digital Government Index (DGI)</i>
<i>Methods</i>	Questionnaire survey [Mystery Shopping; Automated tools]	Questionnaire survey [expert group meeting]	Questionnaire survey
<i>Study focus</i>	a) To what extent and how are different technologies being implemented.	a) Analysis of global and regional trends based on the 2020 EGDI.	It offers the DGI composite ranking and scores and reflects on the performance of surveyed

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	EC (van der Linden et al., 2021)	UN DESA (2020)	OECD (2019)
	b) To what extent and how specific government domains evolve. c) What factors influence the performance of the countries and how can the countries learn from each other? d) Good practices from all participating countries.	b) Regional challenges, opportunities, and initiatives. c) An assessment of local e-government in 100 major cities. d) Focus on online participation as reflected in EPI data and provides an analysis of relevant policy trends. e) The importance of data governance at the national level and summarizes the prevailing trends surrounding data-centric digital services. f) The broader scope of capacity development for digital government transformation. g) How the role of e-government and efforts to achieve digital equity has been amplified by the nexus of digitalization and the social impact of the COVID-19 pandemic.	countries in the DGPF dimensions.
<i>CEE countries (rank)</i>	ES(2), LV(10), LT(12), SI(18), HU(22), CZ(23) , SK(25), BG(27), PL(28), RO(34)	ES(3), LT(20), SI(23), PL(24), CZ(39) , BG(44), SK(48), LV(49), HU(52), RO(55)	SI(17), ES(18), LV(19), CZ(22) , LT(27)

When we are focusing on the digital single market, which is an important goal of EU, citizens should be able to use the services of electronic government no matter their nationality or place of residence. This statement is a confirmation of the importance of high-quality e-government services in member countries. The key policy priorities are formulated in important documents by the European Commission, such as the eGovernment Action Plan 2011-2015 and subsequently 2016-2020.

In the study by the European Commission (van der Linden et al., 2020) “bench learning” analysis calibrates the benchmark performance of each country against various country characteristics. This tool enables mutual learning and consists of two main steps. The first is to analyse the performance of the e-government of the countries, evaluated through two absolute indicators (penetration and digitization). The next step is to evaluate the specific country’s contents through a series of relative

indicators. The Digital Economy and Society Index (DESI, 2021) has been adjusted to reflect the two major policy initiatives set to have an impact on digital transformation in the EU in the coming years: the Recovery and Resilience Facility and the Digital Decade Compass.

Over the past ten editions, the United Nations E-Government Survey has established itself as both a leading benchmarking reference on e-government and a policy tool for decision-makers. It serves as a benchmarking and development tool for countries to learn from each other, identify areas of strength and challenges in e-government, and shape their policies and strategies in this area. The survey measures the effectiveness of e-government in the delivery of public services and identifies patterns in e-government development and performance, as well as countries and areas where the potential of ICT and e-government has not yet been fully exploited and where capacity development support could be helpful. (UN DESA, 2020).

Compared to other studies, the UN's contains by far the largest number of countries surveyed. The Survey tracks progress in e-government development through the UN E-Government Development Index – EDGI. The EDGI is a composite index based on the weighted average of three normalized indices: one-third is derived from the Online Service Index, one-third from the Telecommunication Infrastructure Index, and one-third from the Human Capital Index. The data are complemented by the information obtained via the Member State Questionnaire, which assesses the developments at the national level (like providing whole-of-government approaches, e-participation, mobile services, multichannel service delivery, as well as innovative partnerships using ICTs).

The study by the OECD (2019) delivers a detailed analysis of the results for each of the dimensions of the OECD Digital Government Policy Framework. It is based on evidence collected through the Survey on Digital Government 1.0, which measures the maturity level of e-government strategies. The study uses indicators related to the six dimensions of e-government. From the CEE area, Romania and Bulgaria are not members of the OECD. Unfortunately, in the OECD (2019) study, data are not available for Slovakia, Hungary, and Poland.

Since the late 1990s, various ambitious e-government strategies have been approved in both researched countries. The e-government strategies of the Czech Republic also have not been evidence-based. Their texts usually do not integrate any evaluation of the status quo on which they would try to build their strategic priorities and objectives. In addition, they also often fail to consider the results of international benchmarking studies produced for the EU or by the UN or other evaluations that would enable at least some strategic analysis before a policy is decided. They even do not rely on data produced by the Czech Statistical Office, which annually evaluates selected aspects of readiness for e-government (use of ICT by households, individuals, and businesses) and use of ICT in public administration (Špaček, 2015). Within the G2C issue, the OECD (2019) argues that it is necessary to involve citizens and businesses in e-government reforms. Engaging all stakeholders is essential to ensure that all e-government processes and services are fully aligned with the expectations, preferences, and needs of the users.

Available surveys from CEE countries have shown a low level of digitization of administrative services for citizens (Zhao et al., 2014; Androniceanu et al., 2022). In the conditions of the Czech Republic, the results of research by the authors Špaček et al. (2020) confirm and clearly indicate that the digitization of basic services, for which the national level is responsible, is low in comparison with local services. There is no connection between the available electronic means of communication and methods of electronic conversion of documents. However, in a study by the OECD (2019), the Czech Republic, Slovenia, and Greece are countries that perform especially for the open-by-default dimension (methodology issue?). In the Czech Republic, there exist a national portal (<https://portal.gov.cz>) within which a portal for citizens was launched in 2018.

Public administration information systems in Slovakia have achieved the electronization of public administration processes, but citizens do not sufficiently benefit from investments in IT. The citizen must continue to initiate applications, and the public administration works on its own agendas and does not focus on solving the citizen's life situations. Simple filing automation and proactivity are not perceived today as the target state of e-government services. The potential for savings that can be achieved in the costs of administrative activities using digitization has so far manifested itself only minimally in Slovakia (MIRDI SR, 2021). The strategic document "The national concept of public administration informatization" transformed the strategic goal into four priority axes and sub-objectives: better services, digital and data transformation, efficient IT, and cyber and information security. Digital transformation is one of the main pillars of Slovakia's Recovery and Resilience Plan, with the main emphasis on public services, skills, and business digitization.

2. Research methodology

Based on a detailed literature review, the paper uses a simplified framework that abstracts from complicated and politically influenced methods. They often fail to adequately and easily integrate the different types of services provided while being data intensive.

The method used in comparison to other benchmarking frameworks also represents a less time-consuming and at the same time clearer choice, while providing more flexibility compared to a more qualitative approach. The framework strives for technological neutrality, i.e., without further examination of the specific technologies used. When evaluating, explaining, and discussing the level of available services, it focuses on the evaluation of citizen orientation; therefore, the perspective of services for citizens is subsequently linked to the perspective of operation and technology. The method evaluates the extent to which online services are available and whether they support the smooth start and completion of an administrative task. This is precisely because it is possible to differentiate the level of e-transactions more and to reveal the level of digital e-government services from the perspective of the user, who does not need to understand the level of integration

of services. The application of the method helps to overcome the problems in the study of the problem using phase models, which were pointed out by the authors, Meayerhof and Nielsen (2017).

The assessment of the situation of the e-government was made based on a study by Špaček et al. (2020), where a score was awarded to a set of selected public services through the information available from national portals and websites of the three largest cities in the country. The research results in this study are based on a simple approach that abstracts from overly complicated methods that are resource intensive and often fail to easily integrate certain types of services. In contrast, the approach used aims to be technologically neutral and provides more flexibility than more qualitative approaches. The advantage of applying this approach is the quick use and clarity compared to another benchmarking framework. Table 2 contains the scoring approach at certain levels of e-governance. The model helps differentiate between the individual levels of available online services and evaluates the extent to which they can be started and successfully completed. In the case of Slovakia, we proceeded similarly to the authors of the mentioned study in selected CEE countries, by examining the central public administration portal (www.slovensko.sk) and the websites of the three largest Slovak cities (Bratislava, Košice and Prešov) as the main data sources. Additional data were collected for Czechia in order to update the results published by Špaček et al. (2020). The same methodology was used and for services provided by local authorities, the 3 largest cities were considered (Prague, Brno, and Ostrava).

Table 2. Scoring approach at certain levels of e-governance

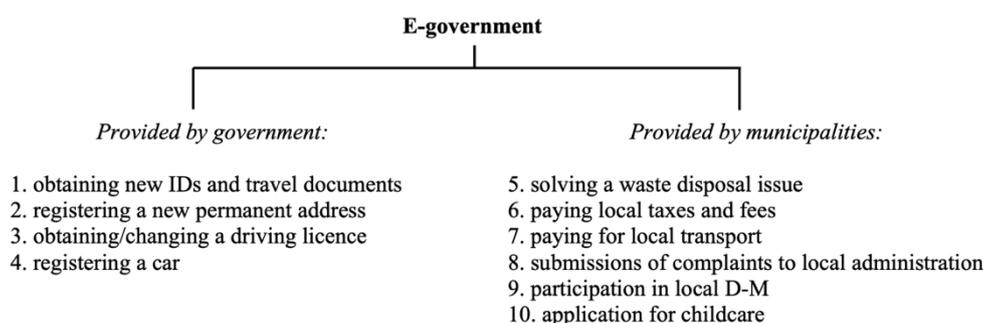
Level of e-governance	Description	Potential score
NO E-PRESENCE	Services are not available online.	0
SIMPLE E-INFORMING	Website or portal, a simple presentation containing one-way information (control of coverage in the context of current technological developments (e.g., adaptation to mobile devices) - access to public administration information from various types of devices.	0.1 - 2
SIMPLE E-TRANSACTING	Certain tasks are available (e.g., it is possible to download a form, or fill in a form online), but they cannot be fully completed (forms can be downloaded but cannot be filled in using the platform and authenticated by the form submission).	2.1 - 4
ADVANCED E-TRANSACTING	A user can complete the entire process online via the platform (online transactions are available while a user can be authenticated, fill in the form, and then submit it online).	4.1 - 6

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Level of e-governance	Description	Potential score
FULLY COVERED E-TRANSACTION	The last level of digital interaction between a citizen and a government reaches a higher level compared to the previous. At this level, tools are available to support the seamless use of e-services by users, as well as more comprehensive online services (e.g., it is possible to save concepts, save documents, personalization, reduce the number of fields to fill due to data sharing and user authentication tools, etc.).	6.1 - 8

(Source: Špaček et al., 2020)

The list of ten e-services shown in the scheme that we consider important for citizens is important for research, based on the hypothesis that they are high-impact administrative services. This means that they are frequently used and relevant for many citizens (e.g., paying local taxes and fees, building permit applications, car registration, etc.) and they are not those that citizens use sporadically or not at all. It is abstracted from such e-services, which are intended for companies and other organizations. Emphasis is placed on the services of the e-government that are provided by the government and those that are provided by municipalities.



The available literature, including government documents, does not contain a list of basic e-government services that would deal with their evaluation. The European Commission (2001) compiled a list of 20 e-government services during the benchmarking of eEurope initiatives, with the European Commission and member countries combining services for citizens and businesses (van der Linden et al., 2017; Tinholt et al., 2017, 2018). The list lacks e-services provided by municipalities, which are used by almost every adult citizen (e.g., solving waste disposal, paying local taxes and fees, paying for local transport, engaging with decision-making bodies, and applying for childcare). For this reason, it is questionable at what level, from the citizen's point of view, e-government services are in the G2C area.

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The reason for choosing these ten evaluated services is the ability to compare the results of the Slovak Republic with the results of the Czech Republic. The selected services represent a common base for research in countries that have different e-government systems, which is also assumed due to differences in strategies and levels of digitization. Based on the proposed framework, a table was created which contains a detailed description of the e-services provided by the government and municipalities together with the assigned score. Due to the final score, it was possible to compare electronic public administration in Slovakia and the Czech Republic.

3. Research results and discussions

The results of the research point to the difference in the provision of services not only regarding the service provider but also within the conditions of using electronic public administration. First, it is necessary to emphasize the need for the citizen to have an eID to be able to use e-government services at all. According to Špaček et al. (2020) an eID and new legislation (approved or discussed) are associated with high expectations of citizens' rights in the digital age in terms of the means of communication to be used on the principles governing the provision of public services. In Slovakia, an identity card with an electronic chip has been issued since December 2013, while a comprehensive law on e-government was approved in September 2013.

In the group of services for which the central government is responsible, we observe different approaches depending on the e-service as outlined in Table 3.

Table 3. Digitalization of core administrative services provided by central government – the case of Slovakia and Czechia (scores and comments)

	Services	Score given (SK)	Score given (CZ)	Comments - summary
1.	<i>Obtaining new IDs and travel documents</i>	4,5	2,5	This is a national service in Slovakia and Czechia. In SK, there is no complete online transaction for it, and a personal visit to the clerk's office is still required. On the national portal, information is available that describes the service and related requirements. For simple e-transacting is available only file application case that citizen has an eID and wants to make changes (for example, registering a new permanent address or 180 days before the expiration date). New applications are prepared on-site by civil servants. Meetings can be made online. For travel documents, it is possible to submit the application only in person. In the case of CZ, only information describing the service and related

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	Services	Score given (SK)	Score given (CZ)	Comments - summary
				requirements is available on the national portal. No components for simple e-transactions are available (like downloadable forms), but applications are prepared on the spot by civil servants. In the case of some cities, appointments can be made online.
2.	<i>Registering a new permanent address</i>	7	1,5	In SK, personal visits to the responsible authorities (town/city) are required. Simple e-transacting is available to citizens. In CZ, personal visits to responsible authorities are required and no tools for simple e-transactions are available to citizens.
3.	<i>Obtaining/changing a driving license</i>	3	2,5	This is a national service in SK and CZ. In SK, the situation is similar to the digitalization of services related to obtaining new travel documents, but the status of your issue can be tracked. No such tools are available in CZ. The responsible authorities only inform on their website which driving licenses have been issued (based on the dates of the application).
4.	<i>Registering a car</i>	7,5	2,5	This is a national service in SK and CZ. In SK, applications can be submitted online only by citizens with an eID, and fees can be paid online in several ways. The status of the applications can be tracked. It is also possible to make appointments online. In CZ, only downloadable forms are still available, which have to be submitted to a responsible department of a municipal service, so personal visits are still necessary.

In the case of services for which municipalities are responsible, the situation in both countries can be summarized as presented in Table 4.

Table 4. Digitalization of core administrative services provided by municipalities in Slovakia (scores and comments)

	Services	Score given (SK)	Score given (CZ)	Comments - summary
5.	<i>Solving a waste disposal issue</i>	7	6,5	In Slovakia, it is a local service and municipalities are responsible for exporting waste. In general, there is a description available on the national portal, but on the web pages of individual towns and cities, there is more detailed information. Citizens can register online as waste producers and have their user

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	Services	Score given (SK)	Score given (CZ)	Comments - summary
				<p>account within which they can administer payments (only in Bratislava and Košice), payment by bank transfer is also available. Their functionality cannot be tested, because it is linked to a prior registration and a permanent residence of a citizen.</p> <p>In CZ, municipalities are responsible for this service, and some contract this out. The description is not available on the national PA portal but on web pages of individual towns and cities. Two of the largest cities (Brno and Ostrava, in Prague this is still not possible) offer instruments for e-payment. However, their functionality cannot be tested, because it is linked to a prior registration and a permanent residence of a citizen.</p>
6.	<i>Paying local taxes and fees</i>	5,5	5,5	<p>This is a local service in Slovakia. Description in general is available on the national portal, but on the web pages of individual towns and cities, there is more detailed information. Their provisions can be decentralized, and the administration of payments and related services is determined by existing structures. Citizens are also required to pay administrative fees for dogs or local property tax directly. It is possible to download, and fill out the form online and e-submission (only in Bratislava and Košice). The structure of administration of the fee for dogs depends on individual cities – in Bratislava, for instance, the city districts are responsible for it. The local property tax is administered by the Tax Office of the Slovak Republic and the money collected is then distributed to individual municipalities. In the case of most fees, payment by bank transfer is available; in the case of some of the local services, citizens can register and have their user account within which they can administer payments.</p> <p>In CZ description is not available on the national PA portal but on the web pages of individual towns and cities. Their provision may be decentralized and the administration of payments and related services is determined by existing structures. Water supply is usually administered by municipal companies.</p>

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	Services	Score given (SK)	Score given (CZ)	Comments - summary
				Citizens are also required to pay administrative fees for dogs or local property tax directly. The structure for the administration of the fee for dogs depends on individual cities – in Brno, for instance, city districts are responsible for it. Local property tax is administered by the Tax Office of the Czech Republic and the money gathered is then distributed to individual municipalities. In the case of most fees, payment by bank transfer is available, in the case of some of the local services, citizens can register and have their user account within which they can administer payments.
7.	<i>Paying for local transport</i>	7	7	It is a local service and in the case of large cities in SK and CZ, a city business company is usually established and is related to the city budget. The service description is not available on the national portal but on the web pages of the companies of individual city businesses. Local transport payments can be made online, and in all three cities, mobile applications are supported.
8.	<i>Submissions of complaints to local administration</i>	5,5	6	In SK, there is a sign of a centralized effort, but with a lack of information. More details In Bratislava and Košice, there is a way to send a complaint through electronic forms and to receive an answer through email or in their user account. In CZ, submissions can be made using various means (e-registry-office - “e-podatelna”; e-mail, through an application where, upon prior registration, citizens can track their submissions). The procedure was enabled in July 2009 via data boxes, but for citizens it is voluntary. If set up, data boxes can be used as a file repository, and also as an instrument for requesting public information based on the freedom of information legislation. E-services for citizens can also be integrated into larger information systems of cities. In the case of petitions, according to legislation, only paper petitions can be submitted; e-petitions are not allowed at the moment.
9.	<i>Participation in local D-M</i>	4	4	The electronic means for the participation of citizens in the decision-making of local authorities in SK and CZ are generally rather underdeveloped. ICTs are used by

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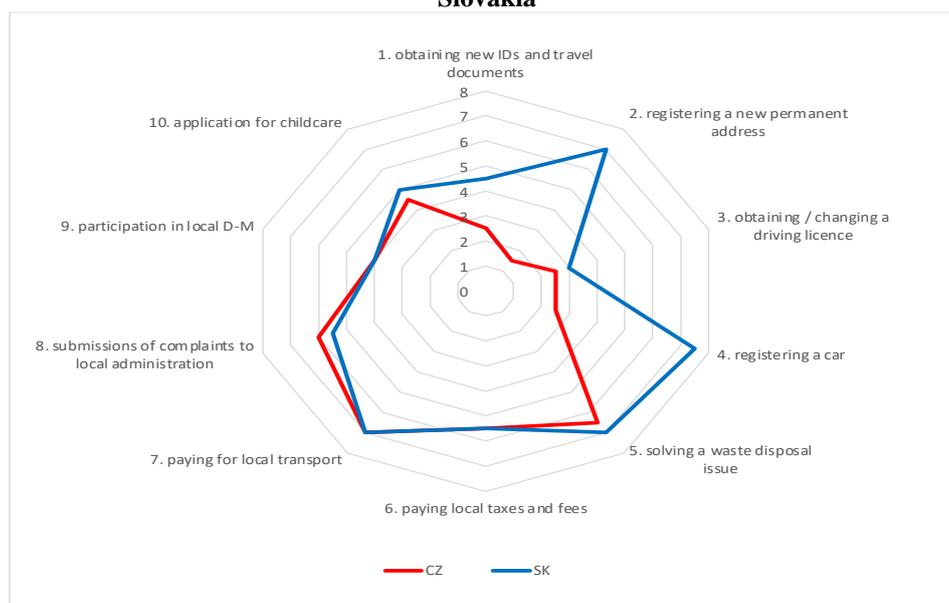
	Services	Score given (SK)	Score given (CZ)	Comments - summary
				<p>some cities to obtain feedback by e-mail or input for participatory budgeting. In Bratislava and Košice, participatory budgeting initiatives have been implemented only in some of their city districts.</p> <p>In CZ, Brno has been using participatory budgeting on the city level regularly. In the case of Ostrava and Prague, participatory budgeting has been implemented only by some city districts.</p>
10.	<i>Application for childcare</i>	5	4,5	<p>In SK, municipalities are responsible for primary education (kindergartens and primary schools). The application procedures may vary. In the case of the three largest cities, Bratislava and Košice an e-tool is available for application for childcare on the whole city territory. In Prešov, it is necessary to arrange an application in person.</p> <p>In CZ, municipalities are responsible for primary education (kindergartens and primary schools). Application procedures may vary. In the case of the three largest cities, only in Brno, an e-tool is available for applications for childcare on the whole city territory. In Ostrava and Prague, it is decentralized to individual city districts.</p>

Based on a comparison of the Czech Republic and Slovakia (figure 2, appendix 1), it can be argued that within the basic e-services provided by the government, the Slovak Republic achieved a higher score. The reason for these differences in all four e-services is the level of e-governance, as in the conditions of the Slovak Republic it is possible to complete several transactions online.

We observe the lowest difference in the score when obtaining/changing a driver's license, where in both countries even simple electronic transactions are not available, but at least it is possible to arrange the date online.

There are no significant differences between these two countries when obtaining new travel documents. If we consider the e-government services associated with obtaining an eID, the possibility of submitting an online application plays in favour of a higher score for Slovakia, but only if the citizen already has an eID.

Figure 1. Digitalization of core administrative services for citizens in Czechia and Slovakia



We observe significant differences, especially in the two electronic services of public administration provided by the government: the registration of a new permanent residence and the registration of a car. The Slovak Republic achieved the highest score in these two e-services. In both cases, a fully covered e-transaction is available. In the Czech Republic, only forms can be downloaded and tools for simple electronic transactions are not available.

Research suggests that in the case of basic e-government services provided by municipalities, some simple or advanced transaction tools are available. Within the e-government services provided by the municipalities, the examined countries achieved the same score in several cases. This is mainly because in Slovakia, despite significant progress in the digitization of local governments, Prešov, as the third largest city, does not have such advanced and accessible e-government services, which has reduced the overall score.

Both countries achieved the same scores in the three basic e-government services, i.e., paying local taxes and fees, paying for local transport, and participating in local D-M. The situation in both countries is the same, their provision is decentralized, while in both cases local property taxes are administered by the Tax Office of the country. In Slovakia and the Czech Republic, municipalities are using ICTs to obtain feedback to a lesser extent. In the case of cities that are divided into several city districts, in both countries, they do not use the possibility to provide this service centrally but only individually within the city districts. Transport is covered by the

city's business entities, whose electronic services are at a high level, which corresponds to the assigned score.

The Czech Republic achieved a higher score compared to one of the basic e-government services examined: complaints submissions to the local administration. In the Czech Republic, it is possible to send online submissions to authorities in various ways (e-mail; e-mail; via an application where it is possible to track your submission). The Slovak Republic achieved a higher score on e-services provided by municipalities, e.g., solving and waste disposal issues and application for childcare. In the Czech Republic, only two of the three largest cities offer electronic payment instruments, as is possible in Prešov (SK). Citizens of Bratislava and Košice within the e-government services have the option of logging into a user account where they can manage these payments. Within the services related to the application for childcare, the reason for the different scores is the use of electronic tools throughout the city (SK - Bratislava, Košice; CZ - Brno). The reason for the less significant difference in this score is the fact that Prague and Ostrava (CZ) have decentralized application systems in city districts. Prešov (SK) does not have electronic public services in this case, and the application must be submitted in person.

Compared to the three largest Czech cities (especially Prague), due to area and population, Slovak cities are significantly smaller. At the same time, they are not so developed in tourist attractiveness in tourism. Despite these reasons, the differences in the score are not very significant, which is why we generally consider the results of the comparison to be positive from the point of view of Slovakia.

Research is focused on only the three largest cities in the country. In the conditions of the Slovak Republic, a significant difference in the provision of e-government services is already visible between the two largest cities and the third. The web portals of Bratislava and Košice can be assessed from the point of view of design as the same, while the colour design of both portals can be considered a difference. These two cities provide more centralized services for citizens in the case of the basic services we examine. Therefore, the results may distort the overall situation within the whole country.

In Prešov, which is the third largest in Slovakia, we record a very different situation, which is reflected in the score for services provided by municipalities. A similar situation can be expected in other municipalities, so even though the score in table 5 reflects the current situation, it may not be sufficient to describe the level of digitization of services in the whole group of municipalities in the country. We consider the evaluation to be almost impossible, as there are almost 6,250 municipalities in the Czech Republic and 2,890 in Slovakia. In the future, the comparison may focus on a larger sample of municipalities. However, it should be

noted that the administrative system used in selected countries has the same effect on potential comparisons.

Based on a study by Špaček et al. (2020), it is possible to compare the results with Hungary and Romania using the same method. In Hungary, the e-government law came into force in 2018, according to which the citizen should choose whether he wants to communicate with the public administration electronically or in person. Public administrations are cooperating, i.e., they have the right to obtain data and information that is already available or collected by another cooperating body. Such general legislation has not yet been approved in the Czech Republic or Romania. Compared to these countries, public administration information systems in Slovakia have achieved the electronization of public administration processes, but citizens do not yet reap sufficient benefits from their IT investments.

In the latest study by the European Commission, the overall e-government performance score for Slovakia is 61% (van der Linden et al., 2021). According to our results, the Slovak Republic scores slightly higher in percentage. The Czech Republic achieves a relatively equal score, which is 2 p.p. higher. As a reason for the differences, we perceive the focus of our research more on services for the citizen than on the overall maturity of the country's e-government. Not only citizen services enter there, but also business services, from which we have abstracted. The results also show that in the EU business services are more digital than citizen services. Now, 91% of services for entrepreneurs can be fully completed online, compared to 77% for citizens.

Compared to countries with a similar environment, the Czech Republic is on the path to penetration while being underperforming in digitalisation. The results point to the fact that even in the availability of e-government services, Slovakia, compared with the Czech Republic, achieves higher values for the penetration performance indicator (by 4 p.p.). In the case of this indicator, Slovakia is above the EU27 average. In the digitization indicator, in which the digitization index captures the digitization level of the back and front offices, Slovakia reaches 61% and the Czech Republic 63%, i.e., the difference between the surveyed countries is 2 pp. In this second absolute indicator, both countries surveyed are below the EU27 average. Five countries (from the CEE, including Slovakia, Slovenia and Hungary) fall into the category of unexploited e-government (opportunities to improve the availability and quality of e-government services still exists). On the other hand, the Czech Republic is characterized by a medium level of penetration, that is, only 3 percentage points below European average, and a medium-low digitization. Therefore, it is included in the non-consolidated e-government, also with Poland, Bulgaria, and Romania. These countries could improve penetration and digitization through public services.

The latest results of the European Commission study confirm the results of our study, in which Slovakia achieved better results in e-government services. They show that

Slovakia matches expectations and is on the same track regarding penetration and digitalisation. On the other hand, Czech Republic results shows performance below the European level, with suboptimal results in penetration as well as digitalization. We consider a greater focus on the citizen to be the reason for the better placement of Slovakia in our research and in the better category by the European Commission. The European Commission DESI report (2021) notes that all EU member states have improved their digital performance but the same are at the top of the member states. The EU countries with lower DESI scores still have abysmal differences. Slovakia overall ranks 22nd out of 27 EU member states in 2021 and stayed at the same position as in 2020. The results show that Slovakia is making progress, but progress is not fast enough compared to other EU member states. The Slovak republic made an improvement of 7 p.p. (DESI Slovakia, 2021). The results confirm the score we awarded to Slovakia, as e-government services achieve advanced e-transiting in most cases. In addition, in the case of the Czech Republic we can say the same. The difference is that the Czech Republic ranked 18th, which is confirmed by the results of the maturity of the e-government by the European Commission, where it ranked higher than Slovakia. However, the Czech Republic lost one place compared to 2020 (DESI Czechia, 2021).

According to The Survey (UN DESA, 2020), both researched countries were for the first time ranked from the high to very high E-Government Development Index (EDGI) group, as well as the other five countries in Europe. In this survey, the methodological framework was based on a holistic view of e-government that incorporates three important dimensions that allow people to benefit from online services and information: the adequacy of telecommunication infrastructure, the ability of human resources to promote and use ICTs, and the availability of online services and content. The results of the study do not match ours, but they confirm the improvement of e-government over time. The Czech Republic is in 39th place and Slovakia in 48th place. The different results in comparison with our study are not surprising. This is because a study by the United Nations focuses more on assessing the development, availability, and capacity to use ICT, while ours has focused exclusively on the use of ICT by citizens. Of the CEE countries, Estonia took 3rd place; the worst was Romania, 55th place.

The OECD study (2019) ranks the Czech Republic 22nd out of the total number of 33 countries surveyed. It is interesting that Estonia is in 18th place in the results. This is usually at the top of the e-government charts. Of the CEE countries, Slovenia ranked surprisingly better, which is presented in table 1. The results of research differ in comparison with the results of van der Linden et al. (2021) and UN DESA (2020). This is due to differences in the dimensions examined and the composite ranking and scores.

The results suggest that despite efforts to create a citizen-centred e-government, this is not yet a reality, as confirmed by other studies. The differences within the countries being compared are obvious, confirming the need to consider the specificities of each country, and according to Shuppan (2009), the control of the e-government context also plays an important role in assessing its level.

4. Conclusions

The research presents the results of the digitization of basic administrative services in Slovakia and the Czech Republic, which follow up on previously published research. It is a qualitative study, the results of which show that both countries surveyed have some reserves and there is still enough room for improvement.

The result of the comparison of the e-government evaluation benchmarking studies in CEE countries is an overview that includes the dimensions examined, the indices used, and the focus of the studies. The different results in the order of the CEE countries in the studies confirm the fact that each of the studies focuses on different aspects. The focus of these studies is more on life events, with our research focusing more on evaluation from the citizen's perspective. Despite the existence of different methods and approaches to e-government evaluation, it is not possible to determine which is the best.

Based on a review of selected areas of e-government, Slovakia achieved a higher overall score compared to the Czech Republic. The results suggest that in e-government services provided by the government in Slovakia, it is possible to fully cover e-transaction (although not with the highest score) for two services: registering a new permanent address and registering a car. In services that fall into this category, Slovakia achieves a higher score in all cases.

From the point of view of Slovakia, the core administrative services provided by municipalities can also be assessed as positive, as in most cases it achieves a higher or the same score. In this type of e-government services, both countries achieve above-average scores, especially in the services of solving and waste disposal problem, paying for local transport and submissions of complaints to local administration. The results also correspond to the ever-increasing level of e-government services by municipalities.

The aim of the paper was to expand existing research, which focused on the CEE countries by Slovakia. So far, four countries (Romania, Hungary, the Czech Republic, and Slovakia) have been examined by the chosen method. Further efforts should be made to expand research to other EU member states which were part of the former Eastern bloc. Due to this, the situation in the CEE area could be summarized and adequately compared with other benchmarking studies that were published in this area.

We see the limitations of the method especially when awarding a heterogeneous score. Furthermore, the components of individual e-government services within the evaluation could be more connected with their digitization. Finally, we perceive the

number of surveyed municipalities as a reserve of the method used. The results of services provided by municipalities can be overestimated due to the situation in the country, as we assumed in the case of Slovakia. It would be interesting to focus on e-government from the perspective of self-governing regions, or higher territorial units. In such a case, it would be possible to examine other services or to create a more complete list of services that are provided to citizens.

E-government is a means of improving public service delivery, increasing people's participation, enhancing transparency, accountability, and inclusion, and ultimately making life better for all. Most countries lack the necessary level of user engagement when designing and implementing e-government initiatives. The way forward is a new digital normal in responding to global challenges and pursuing sustainable development.

Conflict of Interest Statement

There is no conflict of interest.

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Appendix

**Appendix 1 Comparison of the digitalization of the core administrative services
in the Czech Republic and Slovakia (scores)**

	Score	
	CZ	SK
1. Obtaining new IDs and travel documents	2,5	4,5
2. Registering a new permanent address	1,5	7
3. Obtaining/changing a driving license	2,5	3
4. Registering a car	2,5	7,5
5. Solving a waste disposal issue	6,5	7
6. Paying local taxes and fees	5,5	5,5
7. Paying for local transport	7	7
8. Submissions of complaints to local administration	6	5,5
9. Participation in local D-M	4	4
10. Application for childcare	4,5	5
National score (out of 80)	42,5	56
	53,13%	70,00%