

THE DIGITALIZATION PROCESS OF ROMANIAN PUBLIC ADMINISTRATION BETWEEN NECESSITY AND EFFICIENCY

DRĂGĂNESCU MARIUS AUGUSTIN

*PHD. STUDENT, FACULTY OF ECONOMICS AND BUSINESS ADMINISTRATION, WEST
UNIVERSITY OF TIMIȘOARA, TIMIȘOARA ROMÂNIA
e-mail: marius.draganescu@e-uvt.ro*

CERBA CRISTINA,

*PHD. STUDENT, FACULTY OF ECONOMICS AND BUSINESS ADMINISTRATION, WEST
UNIVERSITY OF TIMIȘOARA, TIMIȘOARA ROMÂNIA
e-mail: cristina.cerba@e-uvt.ro*

LOVIN SAȘA SORIN

*MASTER STUDENT, FACULTY OF ECONOMICS AND BUSINESS ADMINISTRATION, WEST
UNIVERSITY OF TIMIȘOARA, TIMIȘOARA ROMÂNIA
e-mail: sasa.lovin85@e-uvt.ro*

POPOVICI CORNEL FLORIN

*PHD. STUDENT, FACULTY OF ECONOMICS AND BUSINESS ADMINISTRATION, WEST
UNIVERSITY OF TIMIȘOARA, TIMIȘOARA ROMÂNIA
e-mail: florin.popovici@e-uvt.ro*

AVRAM ALEXANDRU

*CONF. PROF. UNIV. HABIL., FACULTY OF ECONOMICS AND BUSINESS ADMINISTRATION,
WEST UNIVERSITY OF TIMIȘOARA, TIMIȘOARA ROMÂNIA
e-mail: alexandru.avram@e-uvt.ro*

Abstract

The digitalization of public administration is a pertinent and significant subject matter at the European Union level, and by extension, at the national level in Romania. The primary goal of this study is to examine the process of digitalization in public administration and assess the implications generated by the adoption of e-government services on several macroeconomic variables, namely economic growth, quality of life and potential growth. In this perspective, we shall undertake an analysis of the advantages that digitalization confers, as well as the trajectory that digitalization follows within Romania's public administration. Also, the paper shows several models of best practices with varying levels of digitalization observed within public administration and public services at the European Union (EU) level, as a possible direction that Romanian policy makers can adopt, considering the current level of digitalization and the competitiveness environment at EU level when it comes to the future of IT&C. The paper concludes that countries that had a forward-looking perspective and adopted digitalization measures for public administration in the past will now use the Recovery and Resilience Funds to develop Internet 4.0 elements to solve problems and compute data, as a way of revolutionizing how governments operate and serve their citizens.

Keywords: public administration, digitalization, e-governance, sustainable development.

JEL Classification: O1, O3

1. Introduction and context of the study

Efficient digital public services, also known as e-government, have the potential to offer a multitude of advantages, both for the private and public sectors. These benefits encompass enhanced operational effectiveness and cost minimization for government organizations and enterprises, heightened visibility, and increased engagement of citizens in the field of political

affairs. Governmental entities use Information and Communication Technology (ICT), but there is an inter-national and intra-national disparity in adopting e-government tools.

Furthermore, the concept of e-government includes more than just the implementation of technological tools. E-government needs a fundamental re-evaluation of organizational structures and processes, as well as an adjustment of habits, with an end goal of enhancing the efficiency and efficacy of public service delivery to individuals. When effectively implemented, e-government facilitates streamlined and cost-effective interactions between citizens, businesses, and organizations and the government.

E-governance also has the aim of engaging citizens through electronic channels. The concept of governance implementation refers to the process of enacting and enforcing policies and regulations, the decision-making power is inside a feedback loop between the state to the citizen. According to the Organization for Economic Cooperation and Development (OECD), e-government refers to the use of information and communication technology, specifically the Internet, to enhance administrative processes.

The e-government initiative holds significant importance for both OECD member countries and EU member countries. For this change to be successful and sustainable, examination of government activity is imperative, encompassing aspects such as cost and benefit analysis, demand assessment, and quality of services evaluation. The assessment of the service quality provided by the government holds significant importance, and the focus should be on enhancing the quality of services extended to citizens starting with removing overlapping requirements.

The digitalization of public services is a key process in the digital economy era that, on one hand, contributes to the goal of increasing their efficiency of public expenditure, especially in the context of deteriorated fiscal balances across the board caused by the COVID-19 pandemic. On the other hand, the digitalization of public services is a key measure adopted to offer transparency and fight corruption.

From Romania's point of view, digitalization is an important aspect, being widely discussed and enshrined in all government strategies, both at central and local administration level, but wasn't applied in a coherent manner, but rather in a scattered approach, without a proper integration and collaboration. Thus, digitalization has been, in practice, mostly overlooked by recent governments.

The European Commission has set up a wide range of guidelines and programs regarding the process of digitalization, both for the public and the private sector, given the fact that digitalization is a process that can increase Total Factors Productivity (TFP) which translates into potential GDP. The Digital Europe Work Programme for the years 2023-2024 has named four strategic points that serve as the key elements of support for this program, namely digital skills, digital infrastructures, digitalization of businesses and of public services.

In the current era of transformation, the rapid advancement of digital technologies is significantly altering the economic landscape, exerting a profound impact on various sectors and categories of society. Digital transformation is recognized as a pivotal factor in generating sustainable added value for European Union (EU) countries while, concurrently, advancing governance, society, and the environment (ESG) efficiency.

The Digital Europe Programme aims to strengthen the European Union's essential digital capabilities through its emphasis on artificial intelligence (AI), cybersecurity, advanced computing, data infrastructure, governance, and processing. It also looks to facilitate the effective implementation and optimal utilization of these technologies in critical sectors such as energy, climate change and environment, manufacturing, agriculture, and health.

Given the fact that the private sector is already ahead in terms of adopting digitalization, the public sector must now align itself to the new requirements and desires of citizens. Given the current circumstances, the ongoing transformations in the socio-economic and political landscape, it is imperative for governing bodies to prioritize efforts aimed at enhancing and adjusting to these trends.

This will ensure that society undergoes a continuous evolution in terms of functionality, efficiency, flexibility, and adaptation to present-day realities. Since 2000, governments have declared that the reform of the public sector is a priority, particularly considering Romania's Pre-EU accession era. The lack of concrete actions created the need to step up the implementation of significant reforms to align Romania with the mandated standards at EU level, especially when talking about digital skills.

The goal of this study is to examine the process of digitalization in Romania's public sector. Specifically, it will analyse the impact of European trends on the country's digital transformation. The significance attributed to this topic is called for due to the imperative of establishing an e-government system that enhances potential economic growth.

2. Literature overview

The concept of administration encompasses a collection of administrative organs that are essential within modern society. According to Milakovich (2012) the enhancement of public administration is a fundamental requirement in all nations, particularly considering the advancements in digital technology. The influence of digital presence has demonstrated its significant impact on various aspects of life and business operations, including state administration, industries, and other organizational entities.

The concept of smart digitalization is commonly seen as the use of contemporary information technology to help a variety of socio-economic and technical endeavours within a certain society. Economics literature lacks a precise definition of the word "e-government". It can be seen as the use of newer communication technologies and computer applications by both central and local public administration entities. The primary aim of e-government is to enhance the efficiency and effectiveness of public services.

The implementation of digital services is driven by both the benefits of such a shift and the need to accommodate technological, socioeconomic, and political realities. Such services are presumed to be available permanently, on any day of the week, which allows the citizen to have personalized access, in relation to their own schedule. In addition, there is an increase in transparency, a decrease in bureaucracy and corruption, and citizens no longer must confront complex structures of public administration to gain access to government services. The greater the administration's confidence and fulfilment, the simpler it is for citizens to access public services. The attention of the authorities to the needs and expectations of the citizen exemplifies an efficient public administration, which bases its decisions on information gathered from the recipients of the offered services, which needs a functional feedback system that is accessible to all citizens. Furthermore, the use of technology by workers results in a decrease in the amount of time dedicated to service delivery and fosters the advancement of human capital, thereby augmenting the pool of skilled workers and equipping them with innovative skills. This, in turn, has a beneficial effect on labour productivity. E-government signifies an innovative approach to engaging with individuals and enterprises.

According to Kamolov and Konstantinova, the implementation of e-government offers a practical solution for the modernization and improvement of efficiency in public administration. T. Nam conducted a study investigating the correlation between e-government and the efficacy of government administration and discovered a notable impact of the former on the latter. Archmann and Iglesias (2010) reveals several advantages of employing digitalization in the public sector, such as heightened efficiency and innovation.

The authors argue that this form of governance places greater emphasis on the citizen, reduces bureaucratic processes, and adopts a "market-oriented approach". In their analysis, Twizeyimana and Andersson examine e-government from the standpoint of citizens, a crucial factor in ensuring the effectiveness of this modernized approach to delivering public services. If

individuals show reservations towards embracing changes or have insufficient knowledge or awareness to effectively utilize the various opportunities presented by digitalization within the public sector, the efficacy of public administration may be compromised.

The development of e-governance primarily relates to the provision of online public services, the establishment of telecommunication infrastructure, and the development of human capital skills necessary for using services. The creation of a smart city requires critical transitions that yield solutions based on innovation and adaptation to existing challenges related to environmental protection. A smart city includes creating policies and development strategies in step with technological changes, developing participatory governance systems, and promoting the creation of public-private partnerships to be always adaptable to an ever-changing landscape. A smart city's key priorities are sustainable growth and better quality of life. Residents have access to a wide range of public services thanks to technology, which is driving change in terms of addressing residents' needs and expectations.

Moreover, a smart city has sophisticated, linked systems on which apps are developed to improve people's quality of life in relation to their individual needs. Thus, smart cities are rethinking governance and service delivery, with the goal of increasing cooperation among all involved actors, adapting to European requirements in the field of sustainable development, and integrating new communication technologies and computer applications into daily life.

3. Case study

The literature overview provides evidence that e-government has the potential to boost the economic and social development of nations, in addition to decrease administrative burdens, improving information and service quality, and lowering costs. Corsi et al. (2006) assert that, as indicated by a study commissioned by the European Commission for the e-government unit, the efficiency of public administration can be regarded as a key factor influencing national competitiveness, economic growth, and welfare, given the significant portion of European countries' GDP that is attributed to the public sector. The implementation of e-government serves to enhance public sector efficiency, therefore contributing to the growth of GDP through four primary channels. These channels include the enhancement of labour productivity within the public sector, the expansion of total output in the public sector, the improvement in the efficiency of public administration, and the stimulation of aggregate demand.

Nevertheless, the question arises as to whether the introduction of information technologies in government operations a uniform positive impact on the GDP of all countries will have, given their varying levels of development. Developing nations often encounter challenges related to the adequacy of telecommunications infrastructure and Internet accessibility, resulting in increased costs associated with the adoption of e-government initiatives. In certain instances, these expenses may even surpass the expected benefits, thereby undermining the overall value of such implementations. When considering developing countries, it is imperative to conduct a comprehensive analysis of the implementation strategy for digital government, considering the specific national economic and technological context. This is crucial to prevent the occurrence of discrepancies between the intended design and the actual outcomes, as observed in highly industrialized nations.

Several econometric studies provide empirical evidence of the substantial impact on economic and social development indicators. The E-Government Development Index (EGDI) shows a significant positive influence on the growth of Gross Domestic Product (GDP) that depends on the level of development and usage of E-Government.

3.1 The current level of digitalization in the European Union member states

The United Nations Department of Economic and Social Affairs (UN DESA) has been publishing the United Nations E-Government Survey every two years since 2001. The Survey evaluates the current state of e-government development in all Member States of the United Nations. Throughout its existence, it has accumulated a comprehensive collection of data sets and conducted thorough analyses. The assessment evaluates the comparative e-government performance of countries, rather than providing an absolute measurement. It acknowledges the importance of allowing individual countries to decide the scope and magnitude of their e-government endeavours based on their specific national development objectives and the pursuit of the Sustainable Development Goals (SDGs).

The Survey functions as a tool for benchmarking and development, enabling countries to gain insights from one another, recognize areas of proficiency and difficulties in e-government, and formulate their policies and strategies. Additionally, its purpose is to facilitate and provide information for discussions held by intergovernmental bodies such as the United Nations General Assembly, the Economic and Social Council, and the High-level Political Forum. The survey primarily targets policy makers, government officials, academia, civil society, private sector, and other professionals and experts in the fields of sustainable development, public administration, digital government, and Information and Communications Technologies (ICTs) for development.

Commencing in 2018, the Survey additionally evaluated the specific city portals of the United Nations Member States by employing identical methodology, while incorporating the local Online Service Index (IOSI). In the present iteration, an examination is conducted on the advancements made by the most densely populated city in each nation, following the exploration of 100 cities in the year 2020.

Since 2014, the European Commission has undertaken the required procedures for monitoring the progress of digitalization within each Member State of the European Union. The introduction of the Digital Economy and Society Index (DESI) has addressed this matter. The European Commission generates an annual report using a five-element reference system. The indicators involve connectivity, human capital, use of Internet services, integration of digital technology, and provision of digital public services.

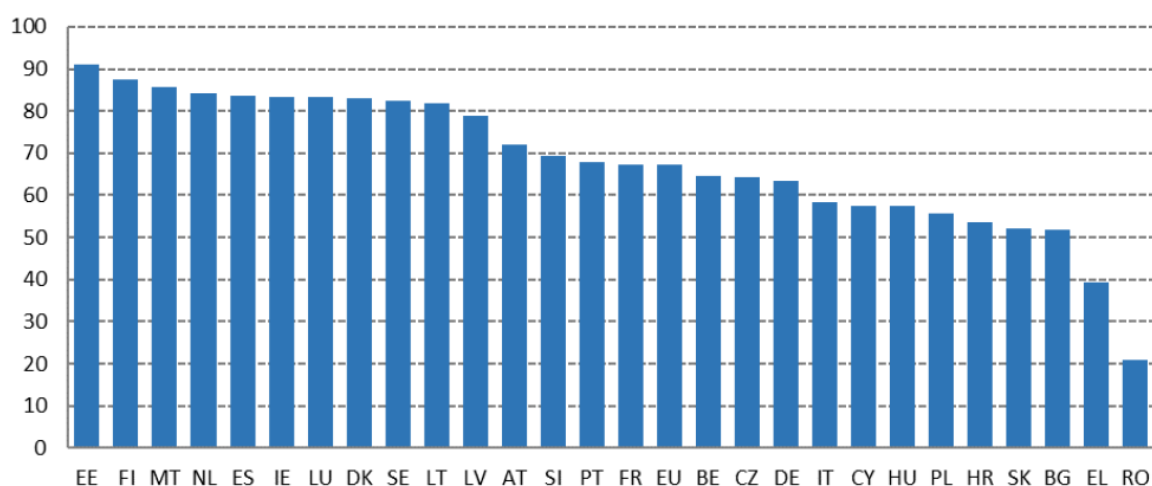


Figure 1. Digital Economy and Society Index (DESI) 2022, Digital public services

Source: DESI 2022, European Commission

The Digital Decade's target is for everyone key public services for businesses and citizens to be fully online by 2030. Several Member States are already close to the 100% target. However, progress is uneven across and within Member States. In terms of digital public services, according

to the 2022 edition, the countries that show the highest performance are Estonia, Finland, Malta, and the Netherlands, whereas Slovakia, Bulgaria, Greece, and Romania reveal the lowest scores.

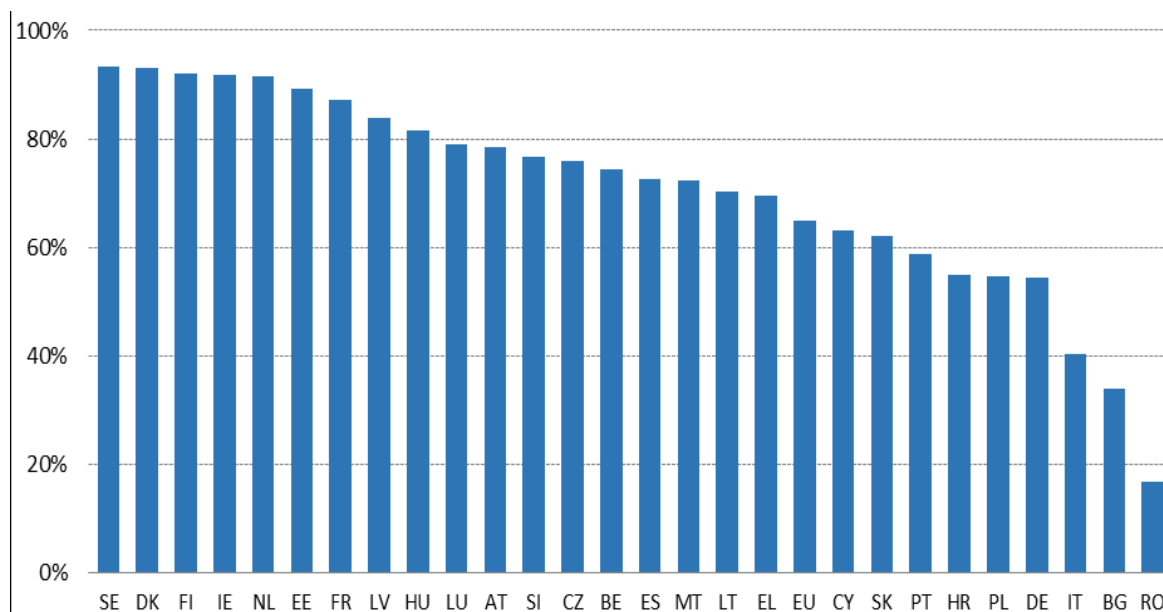


Figure 2. e-Government users interacting online with public authorities over the Internet in the last 12 months (% of internet users), 2021.

Source: Eurostat, Community survey on ICT usage in Households and by Individuals.

According to the Figure 2, internet users of e-government portals, Sweden, Denmark, and Finland are the nations practicing the highest proportion of people who have used the Internet within the previous 12 months to engage with public institutions. The data shows that a significant majority, specifically over 90%, of individuals within the age category ranging from 16 to 74 who utilize the internet, decide to interact with government portals. In contrast, Bulgaria and Romania shows the lowest levels of interpersonal engagement within their public administrations, less than 40% and 20%. According to the latest data, only 35% of Romanians have basic IT skills, being only ahead of Bulgaria in which the average is 31%. In contrast, the European average is 61%. In Romania's case, while the country has made significant strides in various fields, one area that requires urgent attention is the lack of IT skills among its population. In an era dominated by technological advancements and digital transformations, the absence of a robust IT skill set poses a significant challenge to Romania's competitiveness on the global stage. The roots of Romania's population's lack of IT skills, especially in the rural areas, can be traced back to historical and educational factors. Despite efforts in recent years to revamp the education system and integrate IT-related subjects into the curriculum, challenges persist.

The lack of qualified teachers, outdated infrastructure, and a curriculum that struggles to stay current with industry trends hinder the effective development of IT skills among the younger generation. Students often find themselves ill-equipped to meet the demands of the modern job market upon graduation. Another contributing factor to Romania's IT skills gap is the limited availability of specialized training programs and opportunities for continuous learning. While some individuals may have a basic understanding of IT concepts, the rapidly evolving nature of technology requires ongoing skill development. Unfortunately, the infrastructure for lifelong learning and professional development is not as robust as it should be.

The consequences of Romania's population lacking IT skills are multifaceted. On the economic front, the country risks falling behind in the global race for technological innovation. Many industries are becoming increasingly reliant on digital solutions, and a workforce with strong

IT skills is essential for driving productivity and competitiveness. The lack of such skills hampers the country's ability to attract foreign investment and hinders the growth of domestic technology-driven enterprises.

Moreover, in an interconnected world, digital literacy is not only a professional asset but also a civic necessity. A population with limited IT skills faces challenges in accessing information, taking part in online civic activities, and adapting to the changing dynamics of communication and social interaction.

To address this pressing issue, Romania must adopt a comprehensive approach that involves collaboration between the government, educational institutions, and the private sector. Investments in teacher training, modernization of educational infrastructure, and the development of up-to-date curricula are crucial steps. Additionally, creating incentives for businesses to actively take part in the education and training of the workforce can bridge the gap between academic learning and industry requirements.

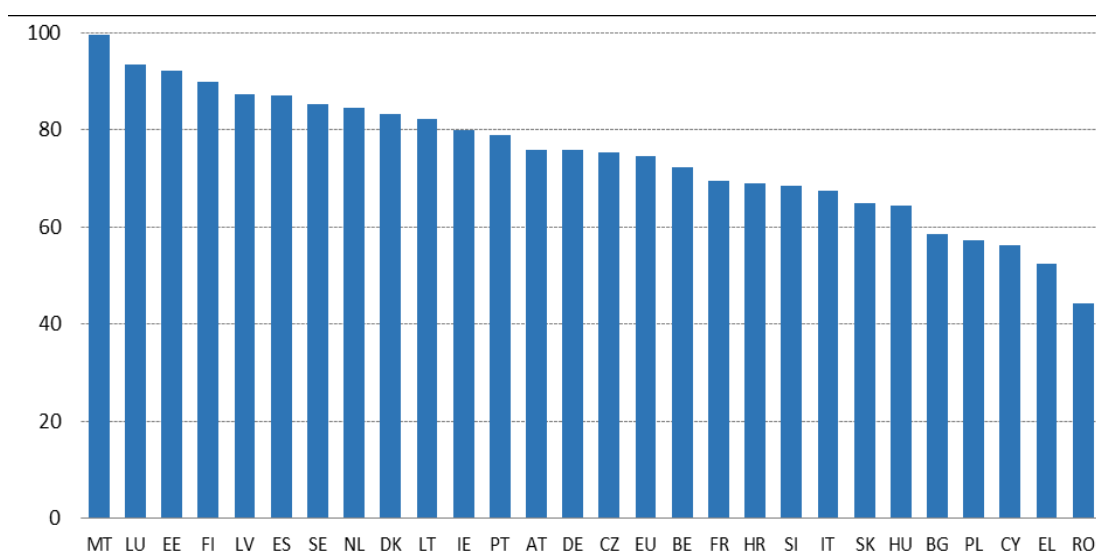


Figure 3. Digital public services for citizens (score 0 to 100), 2021

Source: eGovernment Benchmark, Capgemini.

If we look at the evolution of digitalization over a 6-year period (2017 - 2022), we can see that the fastest growing countries in terms of digitalized public services are Romania and Greece, who have increased their scores by 184%, and 64% respectively. In this timeframe, this improvement had a direct impact on economic growth, as Romania increased the public administration contribution to GDP growth from 0.6% to 1.1%, while Greece's public sector increased its contribution to GDP growth from a negative value or no contribution at all (in 4 of the 6 years observed) to 0.4% in 2022.

The 2030 Agenda's shared goals for sustainable development are set by the European Union and the UN, according to the European Commission. One of the goals, referred to the "Decent work and economic growth," and is associated with Figure 3. This figure highlights the significance of digital public services for citizens as a crucial indicator for economic growth within the context of public administration. Malta serves as a prominent example of a country that has achieved considerable progress in digitalization for its citizens, thereby setting up a successful model for fostering well-being. Luxembourg, Estonia, and Finland are the countries that follow Malta, on the other side Greece and Romania are below 55 points. In the context of digital public services for businesses, the potential for foreign direct investment can be exploited.

A country that has implemented digital public services for businesses has a greater potential to attract new investors and expand its market. This fact is expected to have considerable impact on the trajectory of economic growth. According to an IMF Working Paper analysing 178 host

countries from 2003 to 2018, e-government has the potential to enhance a nation's locational advantages and attract increased Foreign Direct Investment (FDI) inflows. The empirical testing of this hypothesis is conducted through an analysis of unbalanced panel data, and the findings show that e-government has a positive impact on the inflow of foreign direct investment (FDI).

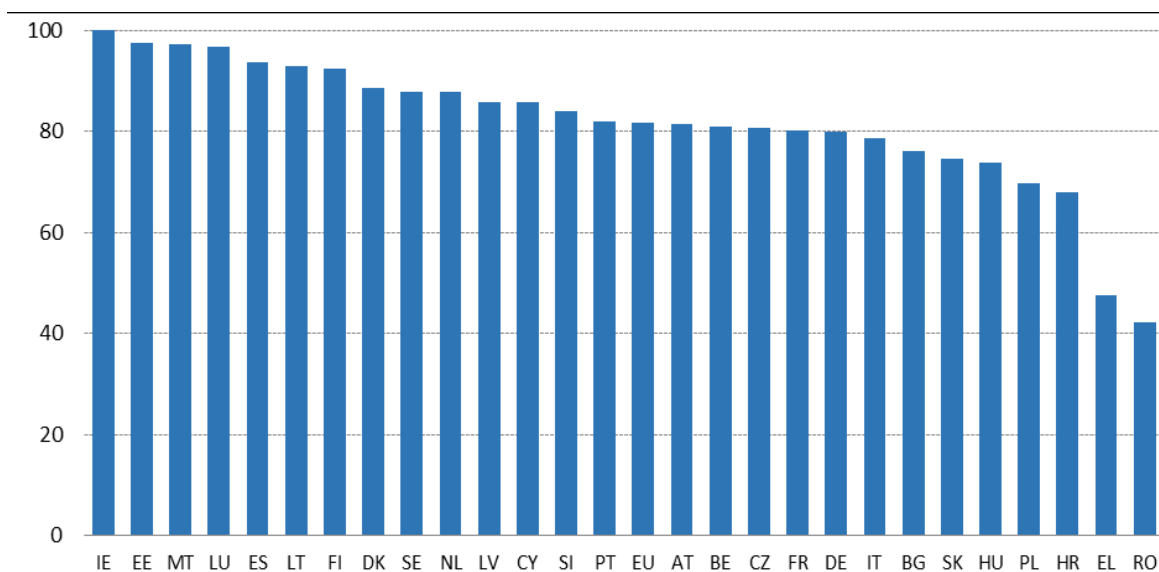


Figure 4. Digital public services for businesses (Score 0 to 100), 2021

Source: eGovernment Benchmark, Capgemini.

This indicator shows in figure 3 the offering of informational and transactional services for businesses, whether they are new or engaged in routine business activities. Ireland has shown a successful model in digital public services for businesses, subsequently serving as a model for six additional countries that have achieved scores exceeding 90 points. However, Greece and Romania have obtained scores below 55 points.

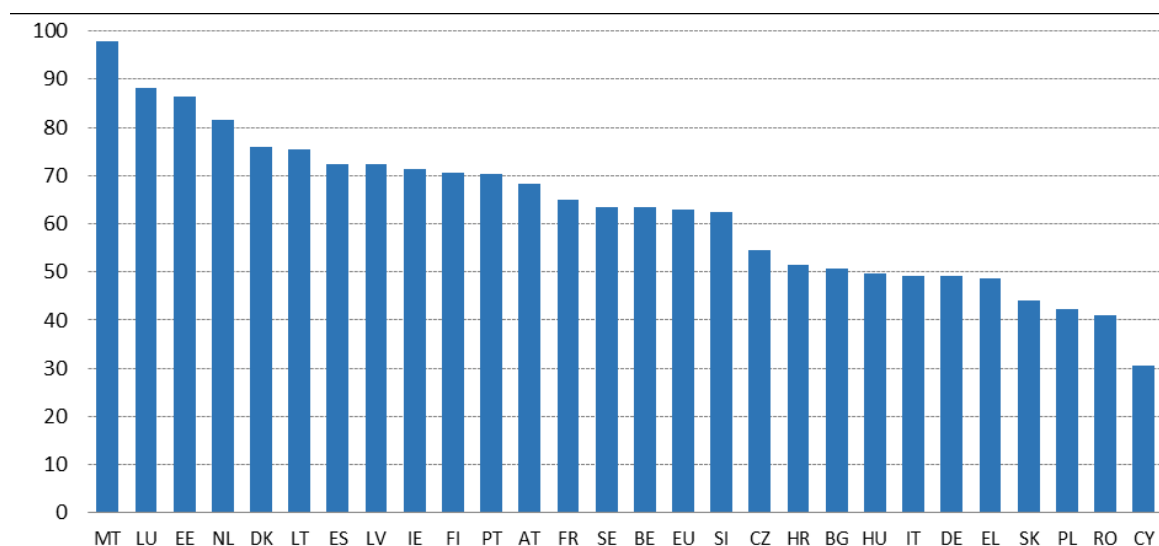


Figure 5. Transparency status in Member States (Score 0 to 100), 2021

Source: eGovernment Benchmark, Capgemini.

3.2 Key Measures in terms of digitalization

Reforms and investments in digital technologies, infrastructures, and processes are imperative to enhance the Union's resilience and foster its innovative potential. Furthermore, they play a crucial role in mitigating the European Union's reliance on external sources by promoting the diversification of critical supply chains. The RRF provides support for initiatives and investments that seek to facilitate the implementation of high-capacity networks, the digitization of public services and governmental procedures, the digitalization of businesses, particularly small and medium-sized enterprises (SMEs), the enhancement of fundamental and advanced digital skills, as well as measures that promote research and development in the digital domain and the implementation of cutting-edge technologies.

In addition to a broad mandate to support the digital transformation pillar, it is mandatory for each Member State to allocate a minimum of 20% of its recovery and resilience plan's total funding towards initiatives that facilitate the digital transition or address the associated challenges. This analysis will focus on countries that rank highest and lowest on the Digital Economy and Society Index (DESI) and examining the key objectives they aim to accomplish through their recovery and resilience programs.

Table 1. Digitalization Measures in the Recovery and Resilience Plans

Estonia	
Target	Amount (Million €)
Digitalizing companies, including small, medium, and micro businesses;	€ 58,00
Digitalizing the public administration, with measures aiming at upgrading digital government services;	€ 97,00
Increasing connectivity, with support to the deployment of very-high-capacity networks in rural areas, which should contribute to the reduction of the digital divide;	€ 24,00
Strengthening the capacity to fight money laundering	€ 4,00
TOTAL	€ 183,00

Finland	
Target	Amount (Million €)
High-speed broadband infrastructure	€ 32,00
Digirail project - European Rail Traffic Management System on the entire national railway network	€ 85,00
Digital innovations for social welfare and health care services	€ 100,00
Continuous learning	€ 32,00
Streamlining work and education-based immigration and facilitating international recruitment.	€ 20,00
TOTAL	€ 269,00
Malta	
Target	Amount (Million €)
Digitalization of the public administration and public services	€ 34,00
Digitalization of at least 360 companies, in particular SMEs	€ 15,00
Reforms - Adoption of Malta's Digital Strategy 2021-2027	No specific funds
TOTAL	€ 49,00

Netherlands	
Target	Amount (Million €)
Investments promoting advanced technologies, such as quantum technology	€ 263,00
Investments promoting advanced technologies, such as artificial intelligence	€ 60,00
Digitalization of education - investment in ICT infrastructure and sectoral knowledge infrastructure of the education system	€ 209,00
Sustainable mobility	€ 149,00
Digitalization of the criminal justice chain	€ 75,00
Upgrades to the IT systems of the Ministry of Defence	€ 94,00
TOTAL	€ 850,00
Bulgaria	
Target	Amount (Million €)
Investment in rural and sparsely populated areas	€ 270,00
Investments to enhance digital skills	€ 319,00
Investments in the Digitalization of public administration and the provision of digital public services (justice, health, employment, and social protection)	€ 297,00
Investments supporting the Digitalization of businesses	€ 15,70
Investments supporting the Digitalization of transport	€ 202,60
Investments supporting the Digitalization of energy sectors	€ 75,70
TOTAL	€ 1.180,00
Greece	
Target	Amount (Million €)
Deployment of fibre optic infrastructure in buildings	€ 130,00
Digital transformation of the public sector	€ 1.300,00
Digitalization of businesses, promoting the integration of digital technologies in SMEs	€ 375,00
Digital transformation of the education and health system	€ 500,00
Digital upskilling	€ 750,00
TOTAL	€ 3.055,00
Romania	
Target	Amount (Million €)
Public administration digitalization	€ 1.500,00
Digitalization of health	€ 470,00
Digitalization of education	€ 881,00
TOTAL	€ 2.851,00

3.3 Successful country models in terms of digitalization of the public sector

The digitalization of the public sector has emerged as a significant subject of interest from both economic and socio-cultural perspectives, as acknowledged by the European Commission. The Sars-Cov-2 pandemic has had a significant impact on critical sectors, including health, education, safety, and security. The digitalization of the sector enables convenient access to information and essential documents for citizens, eliminating the need for physical movement and minimizing the risk of losing valuable resources, particularly time and capital.

However, specific nations are standing out as role models of effective strategies in terms of the digitalization of public administration. These nations have also showed their ability to effectively manage challenges such as the COVID-19 pandemic.

Estonia

The Republic of Estonia, a leader in the EU for digital public services, places a high priority on human-centricity. In 2020, the Republic of Estonia introduced its Digital Agenda 2030, outlining its strategic vision for digital transformation.

Estonia has implemented several strategies to ensure the sustainability of its digital government as we can see below:

Table 2. Estonia Digital Strategy

All public services are human-centric and designed, managed and measured in a uniform manner	Introduction of the management and user-centricity of public services
All the decisions of the state are made on the basis of high-quality data	Data-driven governance and reuse of data
Knowledge, skills and funds required for bold and large-scale digital changes	Empowering digital change in public sector
Estonia is a pathfinder and an eager experimenter	Systematic experimentation with new ways

Currently, all public services have been digitalized and are supported by the X-Road, an interoperability service that provides an effective foundation for digitalization. This software eases the creation of safer, more efficient, and cost-effective environments in various areas.

The X-Road software provides the following:

- A cohesive and protected mechanism for the transfer of data between entities in the public and private sectors.
- Effortless integration and collaboration between public and private sector systems;
- The process of transferring data across national borders;
- A platform for digital signature and encryption of all outgoing data.

Although the digitalization of public administration in Estonia is highly advanced in Europe, Estonian citizens express concerns regarding the drawbacks associated with a complex and cumbersome digital system. These problems lead to a level of public digital service satisfaction in 2019 among private persons was around 69% and 47% among entrepreneurs. One of the key objectives established in this agenda is to achieve a benchmark of 90% digitalization in the administration of public services until 2030.

Denmark

The establishment of a digitalization partnership has been recently undertaken by the Danish government. The individuals involved in the partnership involve chief executive officers (CEOs) as well as experts from various sectors such as business, industry, research, nonprofit organizations, and trade unions. The goal of the partnership is to provide suggestions on how Denmark can progress in four significant aspects of the digital agenda.

Tabel 3. Denmark Digital Strategy

The end of 2020, Danish individuals have had the capability to receive their driving license document in a digital format through a mobile application. The new driving license was more than welcomed, with over 500,000 downloads recorded within the first 24 hours following its release. Subsequently, the number of downloads has surpassed one million. Furthermore, Denmark introduced a digital application version of the Danish health-insurance card in June 2021. In the first month, the application garnered over one million downloads. Denmark introduced a new electronic identification system, known as MitID, in the year 2021.

This new tool has been created with the aim of enhancing the longevity, security, and adaptability of the Danish electronic identification (eID) infrastructure. MitID is a publicly available application that facilitates access to online banking services and enables the payment of taxes. The degree of satisfaction regarding MitID stands at 64%.

3.4 The current level of digitalization in Romania

In Romania, despite seeing advancements in the adoption of self-governance mechanisms in recent times, the domain of digital public services still lacks sufficient progress. This deficit is objectively discernible from multiple international rankings that employ well-defined criteria to evaluate the level of maturity in this domain. It is important to acknowledge that, during the implementation of this public policy, there is currently no comprehensive government-level record of all public services provided to citizens and businesses. This absence blocks the ability to conduct a thorough evaluation of the extent to which these services offer electronic platforms for beneficiary interaction. To accurately assess the extent of digitization in the Romanian public administration and compare it to successful international models, it is imperative to create an inventory or register of all public services offered by both the central and local public administration. Additionally, an analysis of the current level of digital sophistication of these services is essential. This will enable the proper quantification of the digitization gap and facilitate the monitoring of progress over time.

The primary issue that characterizes the state of e-government at the broader, national level is the inadequate progress in the establishment of digital public services in Romania. The issue at that point, which has implications for every citizen of the nation, encompassing both the public and private sectors, continues to position the country unfavourably in international rankings pertaining to this domain. According to DESI 2022, Romania continues to face challenges in the implementation of digital public services. The country illustrates below-average performance across all indicators, including the accessibility of digital public services for its citizens (with a

score of 44, compared to the EU average of 75) and (with a score of 42, compared to the EU average of 82). The use of e-government services by internet users is limited, with only 17% engaging in digital interaction between public authorities and the public.

The allocation of a sizable portion of digital investments and reforms in Romania's national resilience and recovery plan presents an opportunity for enhancing these outcomes. The prompt execution of these measures will contribute to the achievement, by 2030, of the goal outlined in the digital decade initiative, which aims to ensure universal access to all essential public services for European citizens through online platforms. Currently, Romania lacks an electronic identification system. The adoption of electronic identity cards and digital signatures among Romanians is crucial to enhance the efficiency of interactions between public and private sector entities. The NRRP encompasses provisions for the issuance of approximately 8.5 million electronic identity cards, with a designated budget of EUR 200 million. The electronic identity card will be equipped with two digital certificates:

- Accessing online public services by logging in;
- Qualified electronic signatures.

The investments supported by the National Recovery and Resilience Plan (NRRP) are additionally oriented towards the provision of essential public services through online platforms, as well as the establishment of a cohesive framework for government cloud infrastructure development. The following section outlines the primary significant funds allocated for the National Recovery and Resilience Plan (NRRP).

Tabel 4. National Recovery and Resilience Plan of Romania

Implementation of the government cloud infrastructure (675 million euro);
Cloud development and migration (187 de million euro);
Development of e-health and telemedicine system (162 million euro);
Environmental digitalization (52 million euro) and employment and social protection (85 million euro);
Implementation of electronic forms in the field of public procurement (0.85 million euro);
Electronic identity card and digital signature (200 million euro);
Digitalization of the NGO sector (10 million euro) and public service management (10 million euro).

The main goal of these investments is to enhance the efficiency and effectiveness of public administration by exploiting advanced technologies and prioritizing the requirements of both citizens and businesses. This should be associated with the establishment of necessary conditions for the development of policy based on data and the enhancement of compatibility among current digital technologies. Furthermore, the implemented reforms ease the advancement of a cohesive framework for digital public services. The government cloud services reform outlined in the National Recovery and Resilience Plan (NRRP) encompasses two primary areas of focus: the enactment of the Information Systems Interoperability Act and the implementation of the Government Cloud Act.

The impact of electronic public services on national competitiveness, investment safety, business opportunities, productivity, and economic growth is significant. In recent times, there has

been a global trend among governments to advocate for the adoption of information and communication technologies (ICT) to enhance the operational efficiency of the public sector and the delivery of services to the broader populace.

The following are the implications arising from the lack of government action about the development of e-government at the national level:

- One of the challenges faced by individuals is the limited accessibility to public services. This issue is evident in the existing method of delivering public services, which necessitates the physical presence of the applicant at the public administration unit. The interoperability of IT systems within public institutions and authorities is lacking, with only a few exceptions. Consequently, citizens often encounter the inconvenience of having to physically travel between various locations to submit applications and collect supporting documents. These manifestations have a direct impact on the citizens' quality of life as they impose excessive administrative burdens and are incongruous with a contemporary lifestyle that relies on advanced information and communication technology to streamline interactions with public administration;
- The concept of high administrative costs encompasses the financial resources and time spent during the different administrative phases involved in accessing a public service. This includes both the direct costs associated with engaging in such activities, such as transportation expenses to and from the office of the public authority or institution, as well as the monetary value of the time invested. The calculation of administrative costs encompasses not only the beneficiaries of public services, but also the public administration responsible for delivering said services. The utilization of electronic public services results in a notable reduction in costs for users, and the implications for public administration cannot be disregarded;
- A reduction in administrative expenses typically enhances the overall well-being of people as it allows them to reallocate the saved resources (such as time and money) towards activities that hold greater significance for them;
- The current state of citizens' involvement in public decision-making is characterized by a lack of active participation. The use of e-government has the potential to enhance society's capacity to analyse public data and information, while simultaneously diminishing obstacles associated with engaging governmental organizations in significant decision-making processes, such as the implementation of a national strategy or a substantial legislative package. E-participation mechanisms enable citizens to make more effective contributions to public decision-making, thereby enhancing their perception of genuine involvement in these processes and influencing their subjective assessment of their own quality of life;
- The low investment appeal of Romania can be attributed to several factors. Firstly, there is a dearth or inadequacy of electronic public services for businesses, which hampers their operations. Additionally, the perception persists that dealing with public administration procedures is burdensome, time-consuming, and ambiguous. Investors are required to actively facilitate the flow of information between institutions and public authorities, as the "one-time" principle is not consistently adhered to. These challenges discourage foreign investors from establishing new ventures or expanding existing ones in Romania;
- The incidence of significant operational disruptions can arise due to the inadequate digitization or absence of digital public services. These disruptions can impede the functioning of public administration, particularly during times of crises such as the recent SARS-CoV-2.

4. Conclusions

The objective of connecting government departments and public institutions within one website e.g., one-stop shop, reducing bureaucracy by moving from paper to digital forms, increasing the speed and complexity of taxpayer analysis, has been proven to play a crucial role in enhancing the efficiency and effectiveness of internal operations and processes of government. EU Member States that were preoccupied with the process of digitalization around the mid-2010s have now moved to a more focused approach, implementing Internet 4.0 elements in the public sector.

While Romania has made progress in digitalizing the public sector and as a result, processing times and cumbersome approval processes have decreased, improving information flow between various government departments and agencies, and making the government more inclusive, accountable, and transparent still lacks sufficient progress compared with peer-countries.

Romania must, on one hand, continue to reduce red tape and improve transparency as an effort to help fight corruption that still plagues the country. This will in turn not only improve the relationship between citizens and government agencies, but it can also lower the costs of doing business and raise the potential return on investment, factors which are attractive to FDI.

On the other hand, Romania must have a unitary view on the reforms that must be implemented to fight historical and educational factors that have driven a wedge between rural and urban population. This top-down approach must not be viewed as a means in which the central government imposes its will on the local government, but rather as a way in which everybody has a chance to thrive in the new digital age.

The positive effects of such an endeavour are felt not only in the short term, but also in the long term. When we look at the determinants of potential economic growth, digitalization is a part of total factor productivity (TFP) growth which is a more dynamic component compared to labour and capital, so it should be seen by government officials as low hanging fruits of quick wins, as e-government projects can be easily and quickly completed before moving on to more challenging aspects of economic growth.

In relation to policy implications, it is imperative for Romania's policymakers to adopt a proactive stance towards digitalization, encompassing not only the realm of public administration but also the everyday experiences of its populace. Anticipating the future does not entail disregarding the present-day actuality and the challenges that the state presently confronts. The public sector occasionally exhibits a deficiency in fundamental digital skills. Nevertheless, considering the advancing age of the existing public sector workforce, Romania possesses an opportunity to rejuvenate its institutions through the implementation of reforms pertaining to the prerequisites and prospects available within the public sector. These reforms should be aimed at attracting and accommodating recent and prospective graduates who possess the requisite competencies and methodologies for digitizing tasks and procedures within the public sector.

Furthermore, to fully optimize Romania's competitiveness, it is imperative to include the rural population, which accounts for 45.5% of the overall population. Presently, this segment is being left behind due to their limited digital skills and inability to effectively adapt to a rapidly changing environment. Therefore, it is imperative for policymakers to ensure equitable access to IT infrastructure to create a fair and competitive environment. This will enhance the rural population's capacity to successfully adjust to the current digital framework.

In conclusion, it is imperative for Romanian policymakers to establish a solid framework for the implementation of Internet 4.0 technologies. This necessitates the development of a unified vision for both the central and local public administration in Romania. This implies that allocating resources towards the development and implementation of novel technologies can serve to mitigate regional disparities, encompassing both intra-national and inter-national contexts. This entails implementing solutions from the central to the local public administration in areas where there is currently a deficiency in the requisite expertise. The aforementioned factor will not have an impact

on the administrative decentralization, as it only guarantees that economically disadvantaged areas will be compelled to adjust to the demands imposed by the prevailing digital era.

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