Digital transformation of public administration. Challenges and perspectives in Romania and Denmark

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Abstract

The paper analyzes the digitalization process of public administration in the European Union, focusing on a detailed comparison between Romania and Denmark. The main objective is to highlight the best practices, challenges, and key factors in implementing digital governance. The study employs a comparative methodology based on the analysis of strategic documents, official reports, and quantitative indicators (DESI index, OECD, and Eurostat reports). The results indicate significant differences between the two countries: Denmark has adopted a coherent and integrated strategy, while Romania faces structural issues and fragmented implementation. The study's implications emphasize the necessity of a clear strategic vision, strengthening system interoperability, and investing in the digital skills of citizens and public officials to accelerate the digital transformation of Romanian public administration.

Keywords: *digitalization, public administration, e-government, European Union, digital transformation, interoperability.*

JEL Classification: H83, K23, K24, O38, L86

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1. Introduction

The digitalization of public administration is a strategic priority of the European Union, with the role of adapting institutions to the requirements of the digital age. Since the 1990s, the EU has promoted e-government, using information and communication technologies (ICT) to improve the efficiency, transparency and accessibility of public services. This transformation is not just a

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technological modernization, but a redefinition of the relationship between the administration, citizens and the business environment. According to Darrell M. West, e-government[3] reduces bureaucracy and optimizes interactions with authorities, while Stephen J. Andriole[4] highlights its impact on the creation of public value. Thus, digitalization contributes to economic competitiveness and sustainable socio-economic development, requiring the adoption of innovative solutions.

This paper analyzes the theoretical foundations and EU policies regarding the digitalization of public administration, with a focus on the Romania-Denmark comparison. Denmark is a leader in e-government, having a fully digitalized administration, while Romania faces structural obstacles. The study identifies good practices, challenges and relevant lessons for the effective implementation of digitalization in a diverse European context.

Through this analysis, the paper contributes to both the academic literature and the debate on the modernization of public administration, highlighting the importance of technology for an efficient and accessible public sector.

2. Definitions and Concepts

In the context of the digitalization of public administration, clarification of fundamental concepts is essential to understanding the current transformations. This section defines the main terms and sets the basis for a further analysis of policies and practices in the European Union, with a focus on the comparison between Romania and Denmark.

E-Government. E-Government is the use of information and communication technologies (ICT) to deliver public services, facilitate the exchange of information and improve interactions between government, citizens and other entities[5]. The European Commission defines e-government as "the use of ICT in public administrations, combined with organizational change and new skills, to improve public services and democratic processes"[6]. This concept reflects how digital technologies increase the efficiency and accessibility of public services, going beyond the simple digitalization of existing processes and implying a redesign focused on the needs of citizens.

Digital Governance. Digital governance extends e-government, inte-

[3] Darrell West (2005), *Digital Government: Technology and Public Sector Performance*, Princeton, Princeton University Press, p. 10.
[4] Stephen J. Andriole (2018), „Skills and Competencies for Digital Transformation", *IT Professional*, Vol. 20, No. 6, pp. 78-81, DOI: 10.1109/MITP.2018.2876926.
[5] Darrell M. West, *op. cit.* (2005), p. 15.
[6] European Commission, *E-Government*, the document is available online at https://digital-strategy.ec.europa.eu/en/policies/egovernment, accessed on 5.03.2025.

grating policies and strategies that guide the use of digital technologies in administrative processes. Stephen J. Andriole emphasizes that it "implies transparency, accountability and citizen participation as essential elements of modern administration"[7]. An OECD report states that digital governance "refers to the use of digital technologies as an integral part of government strategies to create public value". Thus, digital governance is not limited to technology but aims to strengthen democracy and trust in institutions through a holistic approach.

Interoperability. Interoperability describes the ability of systems and organizations to collaborate and exchange data effectively. Helen Margetts notes that "interoperability is crucial for reducing redundancy and improving integrated services in public administration"[8]. The European Interoperability Framework states that "interoperability is a prerequisite for the delivery of cross-border and cross-sectoral digital public services". Its absence can fragment services, a problem in countries like Romania, where the administration is complex.

Digital Transformation. Digital Transformation involves integrating digital technologies into all aspects of public administration, fundamentally changing the way governments operate. Darrell M. West explains: "Digital transformation is not just about technology but about changing the organizational culture and the way services are designed.[9]" This involves redesigning services to make them more efficient and user-oriented. It is a complex process, requiring the adaptation of administrative structures and mentalities.

Data-Driven Decision-Making. This concept refers to the use of big data and analytics to make informed decisions. Stephen J. Andriole emphasizes that "data allows governments to optimize resources and anticipate the needs of citizens.[10]" Thus, data-driven decisions improve resource allocation and understanding of the needs of the population." In Denmark, this principle is already applied, contributing to more transparent governance.

3. Models and Theories of Digitalization in Public Administration

The digitalization of public administration is a complex process that involves the integration of information and communication technologies (ICT) into government structures to increase the efficiency, transparency and accessibility of services offered to citizens. This section explores the main models and theories that underlie this process, with a focus on their relevance in the context of the European Union and on the differences between the Romanian and Danish experiences, analyzed in detail in the following sections. The specialized literature

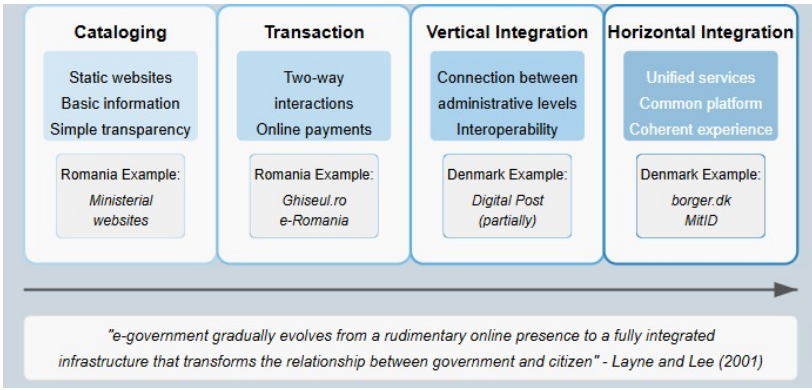
[7] Ibid.
[8] Helen Margetts (1999), *Information Technology in Government: Britain and America*, London, Routledge, p. 112.
[9] Darrell M. West, *op. cit.* (2005), p. 30.
[10] Stephen J. Andriole, *op. cit.* (2018), pp. 78-81.

provides theoretical frameworks that guide the understanding of digital transformation, from the early stages of computerization to the full integration of public services.

Layne and Lee's Maturity Model. The e-government model proposed by Karen Layne and Jungwoo Lee (2001) describes an evolutionary process of digitizing public administration, starting with **cataloging**, where information is available online through static websites, with the main objective of data transparency and accessibility. The next stage, **transaction**, involves two-way interactions between citizens and the administration, allowing for electronic operations, such as paying taxes or requesting documents. As digitalization progresses, **vertical integration** is achieved, which connects administrative systems at local, regional and national levels, facilitating the exchange of information between institutions. The process culminates in **horizontal integration**, in which public services are unified in a common digital platform, offering users a coherent experience and simplified access to public administration.

Layne and Lee emphasize that "e-government is gradually evolving from a rudimentary online presence to a fully integrated infrastructure that transforms the relationship between state and citizen.[11]" This model is useful for comparing the stages of development of Romania and Denmark: Denmark has achieved horizontal integration through the borger.dk portal, while Romania is still between the cataloging and transaction stages, with initiatives such as Ghișeul.ro only just beginning to facilitate two-way interactions[12].

Figure 1. *Digital Transformation of Administration: The Layne and Lee Model (2001)*



Source: *figure created by the authors*

[11] Karen Layne, Jungwoo Lee (2001), „Developing Fully Functional E-Government: A Four Stage Model", *Government Information Quarterly*, vol. 18, no. 2, pp. 122-136, https://doi.org/10.1016/S0740-624X(01)00066-1.

[12] European Commission, *Digital Economy and Society Index (DESI) 2022*, the document is available online at https://www.knjiznice.si/wp-content/uploads/2023/01/DESI_Full_European_Analysis_2022.pdf. accessed on 5.03.2025.

New Public Management (NPM). The New Public Management theory, developed in the 1980s and 1990s, promotes the application of private sector management principles to public administration, emphasizing efficiency, performance, and citizen-centricity. Christopher Hood, one of the founders of this approach, states that "information technology plays a crucial role in reducing bureaucracy and improving the accountability of institutions.[13]" In the context of digitalization, NPM advocated the use of ICT to optimize administrative processes. However, this paradigm has been criticized for fragmenting public services, a visible effect in Romania, where the lack of interoperability between institutions has limited the impact of digital initiatives. In contrast, Denmark has overcome this limitation through strategies that have corrected fragmentation, moving to a more integrated model.

Digital Era Governance (DEG). In response to the shortcomings of NPM, Patrick Dunleavy and his collaborators introduced the concept of Digital Era Governance in 2006, which proposes a holistic approach to digitalization. DEG promotes the reintegration of public services, a focus on citizen needs, and the use of technology as a central element of governance. Dunleavy notes that "the digital age requires a rethinking of public administration, placing the citizen at the center of processes.[14]" This model is reflected in the success of Denmark, where digitalization strategies have prioritized accessibility and integration, in contrast to Romania, where institutional fragmentation and the lack of a unified vision continue to be major obstacles.

The models and theories discussed – the Layne and Lee model, NPM and DEG illustrate the transition from basic informatization to a deep transformation, oriented towards efficiency and citizens' needs. In the EU context, these frameworks differentiate between states such as Romania and Denmark, highlighting both the challenges and opportunities of digital transformation. The subsequent analysis will use these perspectives to assess the specific policies and practices of the two countries.

4. Methodology

We resort to an analysis of public policies at the European Union level, examining official strategic documents (action plans, ministerial declarations, framework programs), European assessments and indicators (such as the DESI index – Digital Economy and Society Index, and eGovernment benchmarking reports). The aim was to identify the priorities assumed by the EU in terms of e-

[13] Christopher Hood (1991), „A Public Management for All Seasons?", *Public Administration*, vol. 69, no. 1: 3-19, p. 3. https://doi.org/10.1111/j.1467-9299.1991.tb00779.x.

[14] Patrick Dunleavy, Helen Margetts, Simon Bastow, Jane Tinkler (2006). „New Public Management is Dead—Long Live Digital-Era Governance". *Journal of Public Administration Research and Theory*, 16: 467-494, p. 470, https://doi.org/10.1093/jopart/mui057.

government, the instruments used for implementation (regulations, funding, coordination) and their impact on the Member States.

To concretize and contextualize the application of theoretical principles, we resort to **the comparative case study** between Romania and Denmark. These countries were chosen due to their contrasting positions in the digitalization rankings: Denmark is recognized as a European and global leader in e-government, while Romania is often at the bottom of the EU rankings on digital public services. The case study involved the analysis of national strategic documents (national digitization strategies, digital agendas), the institutional framework (digital government agencies, relevant legislation), as well as the collection of data on concrete digital projects and services in each country. Quantitative indicators (e.g. percentage of population using e-government services, DESI scores on the "Digital Public Services" dimension) were also integrated to measure the level of progress.

The comparative method consisted of assessing the similarities and differences between Romania and Denmark on several dimensions: strategic vision and governance, key digital infrastructures (eID – electronic identity, service portals), the degree of use of services by citizens, as well as the challenges encountered (barriers). This comparison benefited from triangulation of sources – combining official statistical data (e.g. Eurostat, European Commission reports) with case studies from the literature and national reports – to ensure the accuracy and impartiality of the conclusions.

5. European Union Policies on the Digitalization of Public Administration

European Union policies on modernizing public administration have evolved significantly, moving from simple e-government – the computerization of services – to digital governance, where technology redefines administrative processes and the state-citizen relationship[15]. Initially, EU strategies focused on the efficiency of services through ICT[16], but with digital advances, the emphasis has shifted to interoperability, transparency and civic participation.

The first European strategies focused on developing **e-government**, defined as using information and communication technologies (ICT) to increase efficiency and access to public services[17]. In the EU's vision, this concept includes the computerization of bureaucratic flows, the creation of online service

[15] Noella Edelmann, Nathalie Haug, Ines Mergel (2023), *Digital Transformation in the Public Sector*, in Faïz Gallouj, Camal Gallouj, Marie-Christine Monnoyer, Luis Rubalcaba, and Markus Scheuer (eds.), *Elgar Encyclopedia of Services*, Elgar Publishing, 2023, p. 332, https://doi.org/10.4337/9781802202595.Digital.Transformation.in.

[16] Darrell M. West, *op. cit.* (2005), p. 22.

[17] Ibid, p. 15.

portals and the automation of administrative operations.

However, as digital skills have advanced, the European agenda has begun to shift towards **digital governance**. It emphasizes the integration of ICT as a central element of the administration reform, while also aiming at interoperability, increased transparency, civic participation and the use of data in the development of public policies[18]. Basically, the EU proposes a vision in which technology is no longer just a tool for efficiency, but a catalyst to fundamentally redefine the way in which the state interacts with citizens and the private environment.

The eGovernment Action Plan 2016–2020 introduced principles such as "**digital by default**" (priority online services) and "**once only**" (no repeated requests for data), accelerating digital integration in national administrations[19]. Subsequently, the Ministerial Declarations in Tallinn[20] (2017) and Berlin[21] (2020) consolidated the EU vision on cross-border interoperability and inclusive digitalization.

The eIDAS[22] (910/2014) and Single Digital Gateway[23] (2018/1724) regulations established the legal framework for electronic authentication and unified access to public services in the European space (European Commission, 2018). Currently, **Digital Compass 2030** outlines future directions, aiming at the full digitalization of public services, increasing digital skills and expanding secure infrastructure[24]. Thus, the EU aims not only to computerize the administration

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[18] Patrick Dunleavy, Helen Margetts, Simon Bastow, Jane Tinkler (2006), *Digital Era Governance: IT Corporations, the State, and e-Government*, Oxford University Press, Oxford, pp. 25-29.

[19] European Commission, *EU eGovernment Action Plan 2016–2020: Accelerating the digital transformation of government*, COM(2016) 179 final, Brussels, 2016, pp. 3-4, the document is available online at https://eur-lex.europa.eu/legal-content/RO/TXT/?uri=CELEX:52016DC0179, accessed on 10.03.2025.

[20] European Commission, *Tallinn Declaration on eGovernment*, 6 October 2017, the document is available online at https://digital-strategy.ec.europa.eu/en/news/ministerial-declaration-egovernment-tallinn-declaration, accessed on 10.03.2025.

[21] European Commission, *Berlin Declaration on Digital Society and Value-Based Digital Government*, 8 December 2020, the document is available online at: https://www.bmi.bund.de/ SharedDocs/downloads/EN/eu-presidency/gemeinsame-erklaerungen/berlin-declaration-digital-society.pdf?_blob=publicationFile&v=6, accessed on 10.03.2025

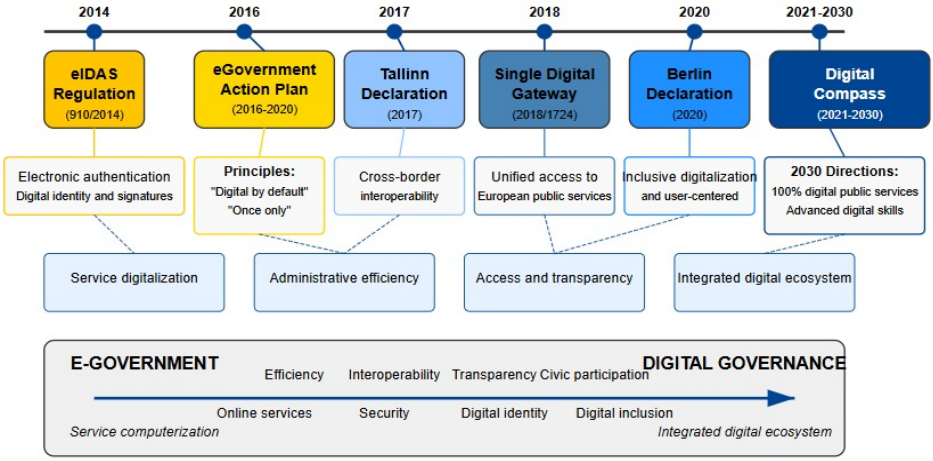
[22] European Parliament, Council of the EU*, Regulation (EU) No. 910/2014 on electronic identification and trust services for electronic transactions in the internal market and repealing Directive 1999/93/EC*, the document is available online at: https://eur-lex.europa.eu/legal-content/RO/ALL/?uri=celex:32014R0910, accessed on 10.03.2025.

[23] European Parliament, Council of the EU, *Regulation (EU) 2018/1724 establishing a single digital gateway to provide access to information, to procedures and to assistance and problem-solving services and amending Regulation (EU) No 1024/2012* (Text with EEA relevance.), 2 October 2018, the document is available online at: https://eur-lex.europa.eu/legal-content/RO/TXT/?uri=CELEX:32018R1724, accessed on 10.03.2025.

[24] European Commission, *2030 Digital Compass: the European way for the Digital Decade*, COM(2021) 118 final, Brussels, 2021, p. 2, the document is available online at: https://eur-lex.eu

but also to create an integrated digital ecosystem, capable of responding to the needs of citizens and the economy.

Figure 2. *Evolution of the European Union's strategic framework for the digitalization of public administration*



Source: *figure created by the authors*

Despite a clear strategic framework, the implementation of digitalization of public administration remains uneven across EU Member States, with countries such as Denmark and Estonia advancing thanks to consistent political leadership, efficient interoperability infrastructures and an organizational culture open to innovation, while others, including Romania, face difficulties related to inter-institutional coordination and low levels of digital skills[25]. Although the EU supports this process through structural funds and monitoring through the DESI index, success depends on national commitment and stability of domestic policies[26]. Documents such as the Tallinn Declaration (2017), the Berlin Declaration (2020) and the Digital Compass 2030 highlight the transition from e-government, focused on the digitalization of procedures, to digital governance, where technology redefines administrative processes and citizen participation, underlining the importance of ethics, inclusion and interoperability.

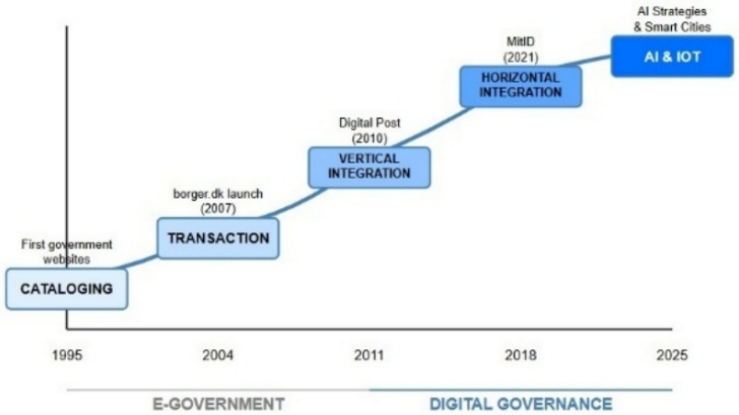
6. Case Study: Denmark – European Leader in Digital Governance

Denmark is a European and global leader in the digitalization of public

ropa.eu/legal-content/RO/TXT/?uri=CELEX:52021DC0118, accessed on 10.03.2025.
[25] Patrick Dunleavy, Helen Margetts, Simon Bastow, Jane Tinkler, *op. cit.* (2006), p. 29.
[26] Darrell M. West, *op. cit.* (2005), pp. 36-39.

administration, evolving from e-government – focused on the digitalization of services – to digital governance, which integrates technology into complex administrative processes to efficiently respond to citizens' needs. Since the 2000s, digitalization has become a national priority, supported by strategic investments in infrastructure, cybersecurity and interoperability[27].

Figure 3. *Evolution of digital maturity in Denmark*



Source: *figure created by the authors*

Platforms such as **borger.dk**[28] (public services portal)[29], **MitID**[30] (secure digital identity)[31] and **Digital Post**[32] (mandatory administrative correspondence)[33] reflect the maturity of this model, facilitating digital interaction between citizens and the state. Municipalities such as Copenhagen use predictive algorithms to anticipate resource needs (e.g. social assistance, traffic), exemplifying

[27] Karen Layne, Jungwoo Lee, *op. cit.* (2001), p. 122-136.
[28] Ministry of Finance Denmark, *Digital Strategy 2022-2025*, 2022, the document is available online at: https://digital-skills-jobs.europa.eu/en/actions/national-initiatives/national-strategies/denmark-national-strategy-digitalization-2022-2026, accessed on 10 March 2025.
[29] Borger.dk was launched in 2007 and constantly improved, this centralized portal provides access to over 1,000 public services, and is designed to be intuitive and personalized, a distinct feature of digital government compared to the simple online presence of e-government.
[30] Darrell M. West, *op. cit.* (2005), p. 78
[31] MitID was introduced in 2022 as a successor to the NemID system, MitID uses biometric authentication and integrates security with data management into a unified platform, reflecting the high standards of digital governance.
[32] European Commission, *Digital Economy and Society Index (DESI) 2023*, 2023, the document is available online at: https://digital-strategy.ec.europa.eu/en/policies/desi, accessed on 10.03.2025.
[33] Digital Post has been implemented mandatorily since 2014, this system eliminates physical correspondence between the state and citizens, reducing administrative costs and accelerating communication, an optimization typical of digital governance.

the use of data for proactive decisions, a pillar of digital governance[34].

Even in Denmark, the transition to digital governance has raised significant challenges, managed through strategic solutions. Digital exclusion[35] has been mitigated through education programs run by public libraries, facilitating access to technology for the elderly or those with low digital skills. In parallel, cyber threats have been combated through continued investment in infrastructure and the implementation of strict security standards[36], an aspect highlighted in the DESI reports. Regarding cross-border interoperability, differences in systems between EU countries have been an obstacle, but the eIDAS[37] regulation has facilitated the recognition of digital identities at the European level, contributing to solving this problem. Denmark thus exemplifies a successful transition from e-government to digital governance, based on a clear strategy, advanced technologies and a citizen-oriented administration. This model offers valuable lessons for countries like Romania, where digitalization is at an early stage and integration and interoperability still represent major challenges. Implementing similar practices, such as infrastructure investments, intersectoral collaboration, and data use, could accelerate the digital transformation of Romanian public administration.

7. Case study: Romania – the Difficult Path of Digitalizing the Administration

In contrast to Denmark, Romania is facing a series of delays and difficulties in the process of digitalizing public administration, although in recent years it has intensified its efforts in this regard. Romania usually ranks last among EU member states in terms of e-government. According to the DESI 2022 index, Romania and Greece recorded the lowest scores in the *Digital Public Services* chapter, well below the EU average. This reality is also reflected in the degree of use by citizens: only about a quarter (25%) of Romanians declared in 2024 that they had used the internet to interact with public authorities in the last year[38] –

[34] Shayane Betiatto dos Santos, Fabio Capellin, Marcelo Trentin, Sandro Cézar Bortoluzzi, Edson Pinheiro de Lima (2022), *Digital Transformation in the Public Sector: Enabling Technologies and Their Impacts*, in Victor Manuel López Sánchez, Francisco Gaudêncio Mendonça Freires, João Carlos Gonçalves dos Reis, Joana Maria Costa Martins das Dores (eds.), *Industrial Engineering and Operations Management* XXVIII IJCIEOM, Mexico City, Mexico, July 17–20, 2022, Springer International Publishing, p. 89.

[35] Helen Margetts, *op. cit.* (1999), p. 145.

[36] European Commission, *Digital Economy and Society Index (DESI) 2023*, 2023, the document is available online at: https://digital-strategy.ec.europa.eu/en/policies/desi, accessed on 10.03.2025.

[37] European Parliament, Council of the EU, *Regulation (EU) No. 910/2014 on electronic identification and trust services for electronic transactions in the internal market and repealing Directive 1999/93/EC*, the document is available online at: https://eur-lex.europa.eu/legal-content/RO/ALL/?uri=celex:32014R0910, accessed on 10.03.2025.

[38] Eurostat, *70% of EU citizens used online public services in 2024*, the document is available online at: https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20250226-1#:~:text=

the lowest percentage in the EU, together with Bulgaria, and compared to the EU average of 70%. In other words, 3 out of 4 Romanian citizens do not yet use e-government services, relying on traditional interactions (at the counter, on paper). This indicator summarizes the major challenge for Romania: *the digital gap* compared to the rest of Europe, both in the offer of services and in their adoption by the public.

Romania recognized the importance of digitalizing the administration relatively late compared to other EU countries. The first consistent strategy in the field was the *Digital Agenda for Romania 2014-2020*, aligned with the Digital Agenda for Europe, which included a pillar dedicated to e-government, interoperability and cybersecurity[39]. The stated goal was to create a modern public administration, by increasing internal efficiency and online access to services for citizens and businesses. However, the concrete implementation left much to be desired: the lack of inter-institutional coordination and insufficient funding meant that many of the targets of the 2014-2020 strategy were not fully achieved (for example, the target of 35% of the population using e-government services by 2020 was not achieved).

It was only in 2020 that an institutional restructuring aimed at giving a new impetus to digitalization took place: the Authority for the Digitalization of Romania (ADR)[40] was established as the central body responsible for the government's digital agenda (taking over responsibilities from the former Ministry of Communications). ADR was given the mission of coordinating e-government projects, developing interoperability policies and standards, and managing common platforms. At the same time, the unprecedented financial support through the National Recovery and Resilience Plan (PNRR) – where approx. 20% of the budget (out of the 29.2 billion EUR) is allocated to the digital transition – made resources available for major investments, such as the creation of the Government Cloud and a National Interoperability System. These ongoing projects aim to connect the institutions' databases and migrate them to a centralized government hybrid cloud infrastructure, which would facilitate the implementation of the "once-only" principle and increase the resilience and security of the systems.

Strategically, Romania updated its objectives with its participation in the Tallinn Declaration and the adoption of the National Strategy for the Digital

Among%20the%20EU%20countries%2C%20Denmark,had%20the%20lowest%20shares, accessed on 15.02.2025

[39] Ministry of Research, *Innovation and Digitalization, Digitalization Guide. Informative benchmarks of the digital transformation of public services,* 2022, p. 74, the document is available online at: https://www.mcid.gov.ro/wp-content/uploads/2024/07/20240702_ghidul_digitalizarii.pdf#:~:text=,1999%2c%20guvernul%20a%20decis%20s%c4%83, accessed on 15.02.2025.

[40] Authority for the Digitalization of Romania, *About ADR*, the article is available online at: https://www.adr.gov.ro/despre-adr/, accessed on 15.02.2025.

Agenda 2020 (later updated and extended for the 2030 horizon)[41]. The transition to digital communication was also explicitly legislated: for example, the Interoperability Law (Law no. 242/2022) obliges public institutions to, within 2 years, no longer request data or documents issued by other institutions from citizens, but to obtain them electronically through the interoperability platform. This law operationalizes the once-only principle and attempts to eliminate the famous situation of "walking papers" between counters by citizens. However, effective implementation requires considerable technical efforts and a change in the way the administration works.

7.1. E-Government Projects and Services in Romania

Although the overall offer of digital services is still modest, there are a few notable initiatives that are worth highlighting, both as successes and as examples of lessons learned:

The national online payment system – Ghișeul.ro. Launched in 2011, the Ghișeul.ro platform facilitates online payment of taxes and fees to public institutions, experiencing significant growth in recent years, especially in the context of the pandemic. Considered the most successful electronic public service in Romania, it exceeded 1 million users in 2023[42] (see **Figure 4**), benefiting from effective promotion and accessible functionalities, such as commission-free payment and simplified authentication. An important factor in adoption was the 10% fiscal incentive for the advance payment of local taxes. The platform exemplifies the success of public-private collaboration, being developed by APERO (Romanian Electronic Payments Association) in partnership with ADR, demonstrating that digitalization can have a significant impact when it offers efficient solutions, saving time and resources for citizens.

Virtual Private Space (ANAF). Launched by the National Agency for Fiscal Administration, Virtual Private Space (SPV) offers online access to their personal tax situation, the possibility of submitting declarations and requests and receiving administrative documents (tax decisions, notifications) electronically[43]. Although SPV is not yet used by all taxpayers, it has become the preferred channel for interaction with ANAF for hundreds of thousands of people in recent

[41] Ministry for Information Society, *National Strategy on the Digital Agenda for Romania 2020*, the document is available online at: https://epale.ec.europa.eu/sites/default/files/strategia-nationala-agenda-digitala-pentru-romania-20202c-20-feb.2015.pdf, accessed on 15.02.2025.

[42] Authority for the Digitalization of Romania, *Almost 100,000 new users registered in January on the Ghișeul.ro platform, administered by the Authority for the Digitalization of Romania*, 2021, the article is available online at: https://www.adr.gov.ro/aproape-100-000-de-noi-utilizatori-s-au-inscris-in-luna-ianuarie-pe-platforma-ghiseul-ro-administrata-de-autoritatea-pentru-digitalizarea-romaniei/#:~:text=juridice%20%C3%AEn%20Ghi%C8%99eul, accessed on 15.02.2025

[43] Ministry of Public Finance, *Virtual Private Space*, the document is available online at: https://static.anaf.ro/static/10/Anaf/Informatii_R/SPV/DocumentePF.pdf, accessed on 15.02.2025.

years, especially since some declarations (such as D112 or tax refund requests) are submitted exclusively online. SPV is an example of relatively successful sectoral digitalization, although it still needs to evolve in ergonomics and integration with other government services.

Local government service platforms. Some Romanian city halls and county councils have developed their e-service portals (e.g. in Cluj-Napoca, Oradea, Bucharest) where citizens can submit various applications online (for urban planning, certificates, permits) or make appointments over the counter[44]. These local initiatives show the potential, but also the fragmentation of efforts: the lack of a unified framework has led to disparate solutions that do not work interoperable and offer uneven experiences to citizens, depending on their locality. A current goal of the ADR is to standardize and aggregate these services in a *national hub* (a future national single portal), so that local services can also be accessed through a central interface – steps necessary to one day achieve an equivalent of borger.dk in Romania.

Electronic Identity Card Pilot Project. A basic digital service was missing in Romania until recently: *electronic identity for citizens*. In 2021, Romania issued the first electronic identity cards (with a chip) in a pilot project in Cluj-Napoca[45], allowing for online authentication of citizens and qualified digital signatures. However, the large-scale implementation of the new electronic ID cards has been postponed several times and is still in its early stages. The lack of a widely used eID has been a major obstacle, as many online services either could not verify the user's identity remotely or resorted to parallel solutions (e.g. authentication with username/password or online banking credentials – as is the case with some institutions). The PNRR is financing the issuance of 8.5 million electronic identity cards by 2026, which could address this gap and pave the way for single sign-on to online public services.

Challenges and causes of delays. Analyzing the situation in Romania, several factors can be identified that have slowed down the process of digitalizing the administration:

- *Institutional fragmentation and lack of coordination:* In the past, responsibility for e-government was dispersed among different entities (the Minister of Communications, and various departments within ministries). The absence of a clear leader and a single coherent strategy led to isolated projects, lack of standardization and even waste (e.g. IT systems developed by different ministries

[44] CityManager, *Evolution and revolution in public administration in Romania through technology*, the article is available online at: https://citymanager.online/, accessed on 16.02.2025.

[45] Euractiv.ro, *Cluj's pilot project of the electronic identity card reached 30,000 documents issued,* 2025, the article is available online at: https://www.euractiv.ro/news/proiectul-pilot-clujean-al-cartii-electronice-de-identitate-a-ajuns-la-30.000-de-documente-emise-70895, accessed on 16.02. 2025.

that do not communicate with each other). The establishment of the ADR somewhat centralizes these efforts, but its effective authority over all institutions needs to be strengthened.

- *Limited administrative capacity and human resources*: Implementing complex digital projects requires technical and managerial skills that the Romanian administration lacks. The low attractiveness of the public sector for IT specialists (due to uncompetitive salaries and bureaucracy) made it difficult to form strong internal teams. The administration often outsourced IT projects to private companies, which sometimes led to dependencies on certain suppliers and loss of control over system development.

- *Inconsistent funding and poor management of IT projects:* Many e-government initiatives in the past decades have failed or remained unfinished (e.g. E-Romania project[46]) due to poor planning and funding interruptions. The absence of a budgeted multi-annual strategy meant that projects depended on annual allocations and changing political priorities.

- *Resistance to change and organizational culture:* The introduction of digital solutions has sometimes encountered internal resistance within institutions – from civil servants who perceive new systems as a threat or an additional burden, to decision-makers who prefer traditional methods. The still heavily bureaucratic and paper-based organizational culture has made innovations slow to be adopted. For example, even where IT systems exist, paper-based procedures are often maintained in parallel, diminishing the benefits.

- *Low level of digital skills among the population:* Romania faces one of the largest digital divides: a part of the young urban population is highly connected and digitally competent, but large segments (elderly, rural areas) have very low basic digital skills. According to Eurostat data, only ~28% of Romanian citizens had at least basic digital skills in 2021, compared to the EU average of 54% (see **Figure 5**). This means that a significant percentage of people do not have the necessary skills to use online services safely and effectively, which requires digital literacy efforts and the maintenance of traditional channels in parallel.

- *Trust and security issues:* In the past, incidents such as security breaches or simply the perception of instability of public platforms have eroded citizens' trust in online services. For example, technical issues with platforms

[46] eRomania wanted to be a complex site where citizens had 20 online services available within the portal's domains, namely e-Health, e-Environment, e-Transport, e-Agriculture, e-Justice, e-Education, e-Culture, e-Church, e-Tourism, e-Association, e-Sport and e-Participation, e-Education, e-Health (electronic medical records), online payment of taxes, but also the standardization of authorizations - according to Economica.net, the article is available at: https:// www.economica.net/eromania-cand-se-lanseaza-cel-mai-mare-portal-din-romania-si-ce-va-conti ne_40144.html, accessed on 17.03.2025.

such as SIUI[47] (the single health information system) or blockages of some government websites have been widely publicized. If citizens perceive digital services as insecure (from a personal data perspective) or non-functional, they will prefer to continue interacting at the counter, even if it is more inconvenient. Therefore, the government must prioritize cybersecurity and system reliability, along with transparent public communication about these aspects, to gain users' trust.

The dynamics of recent years in Romania indicate *a positive trend:* the COVID-19 pandemic has forced many institutions to adopt digital solutions (e.g. online meetings, and electronic filing of documents) and has increased public acceptance of remote interactions. Funding through the PNRR offers a historic opportunity to build critical infrastructures such as the government cloud and interoperable systems, which will be the foundation for integrated services. The success of the Ghișeul.ro platform shows that, where the life of the citizen is simplified, he is willing to go online. The key will be the continuity of efforts and strict monitoring of the implementation of the assumed digital reforms. Romania now has the legislation and plans on the table; the challenge of execution follows, where the lessons offered by the Danish example – the importance of centralized coordination, the widespread adoption of eID, the standardization and gradual mandatory nature of digital channels – can provide valuable guidance.

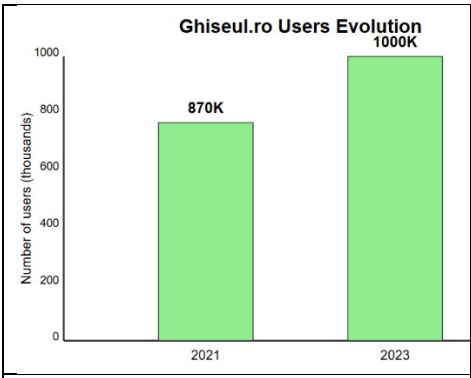


Figure 4. *Evolution of Ghișeul.ro usage*

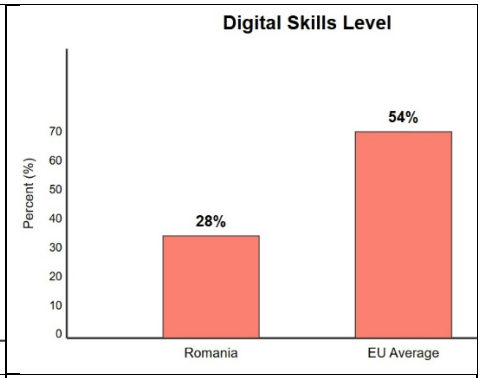


Figure 5. *Level of digital skills*

Source: *figures created by the authors*

8. Comparison Romania – Denmark in the Digitalization Process

The comparative study of the two cases highlights significant disparities

[47] Cursdeguvernare, *State digital platforms, unavailable – neither Ghișeul.ro nor SEAP works; the health IT system functions with syncope*, 2025, the article is available at: https://cursdeguvernare.ro/platformele-digitale-ale-indisponibile-nici-ghiseul-ro-nici-seap.html, accessed on 17.03.2025.

but also points of convergence that are worth discussing. From the perspective of strategic frameworks, both countries have officially stated their commitment to the digitalization of public administration, but Denmark has acted proactively and consistently since the 2000s, while Romania only in the last decade began to formulate strategies and create dedicated institutions (ADR in 2020). The result is that Denmark had a considerable temporal advance, allowing it to go through the stages of e-government (presence, transaction, integration) much earlier. While Denmark has already implemented state-of-the-art measures (e.g. single digital identity, proactive services based on the citizen's life), Romania is still laying the foundations (digital identity at the beginning, connecting databases). Thus, the digital maturity of the Danish administration is superior to the Romanian one - a fact confirmed by the DESI scores and the range of services available online (over 90% in DK vs. under 20-30% in RO of key services).

In terms of key digital infrastructures, the critical difference is the existence in Denmark of a fully formed digital ecosystem[48] (eID + single portal + digital mail + interconnected registers), compared to disparate fragments in Romania. For example, a Danish citizen can complete complex operations entirely online (change their address, change their family doctor, enroll their child in school), receiving confirmations in their digital e-Boks mailbox – all using the same NemID/MitID[49] authentication. In Romania, such an integrated journey is not yet possible: changing their address requires physical presence (at the Population Registration Service), school enrollment is partially digitalized only in certain municipalities, etc. In practice, the user experience in interacting with the administration is radically different: in Denmark, for most interactions, there is *a standard digital solution*, while in Romania, the citizen must navigate a mix of online and offline procedures, often unintuitive. This contrast explains why the usage rate is so different – in Denmark, it is simple and inevitable (even mandatory) to use digital channels, while in Romania you often don't have the digital option, or you don't trust it.

Another important comparative element is regulation and obligation. Denmark used the instrument of legal obligation (for example: exclusively digital communication, and mandatory online submission for certain requests) as a lever to accelerate the adoption of e-services. Romania, on the contrary, has long maintained traditional channels as the main ones, leaving the adoption of e-services to the discretion of the citizens and officials, which has led to a vicious circle: if

[48] IOPEU Monitoring, *Denmark improves the user experience of its Digital Post solution (SKAT, NemID*), the article is available at: https://interoperable-europe.ec.europa.eu/collection/nifo-national-interoperability-framework-observatory/document/denmark-improves-user-experience-its-digital-post-solution-skat-nemid#:~:text=The%20Danish%20Agency%20for%20Digitisation,by%20the%20Ministry%20of%20Finance, accessed on 13.02.2025.

[49] NemID/MitID authentication is a secure digital system used in Denmark for identification and access to government, banking and private online services.

few use online services, the administration is not pressured to expand and improve them, and if the services are not good, citizens do not use them – and so on. Only recently has Romania begun to introduce some *timid* obligations[50] (e.g. exclusively electronic communication with companies about ANAF for certain documents, mandatory online submission of applications for European funds, etc.). The Danish experience shows that, after a digital service reaches a certain level of quality and availability, making it mandatory (with accompanying measures) can exponentially increase its adoption and overall efficiency. Naturally, this must be done carefully in Romania, where digital literacy is lower – inclusion mechanisms are needed (assistance for those who do not manage online, maintaining assisted contact points).

A positive aspect common to both countries is the *alignment with European policies*: both Denmark and Romania participate in EU initiatives (eIDAS, Single Digital Gateway, Ministerial Declarations) and access European funds for digitalization. The difference lies in the efficiency with which they have used these opportunities. Denmark, already having an advanced infrastructure, was able to be in the group of pioneers (e.g. among the first to notify a national eID to the EU according to eIDAS, allowing its citizens to use NemID in other countries as well). Romania is only preparing to notify its future eID and implement the *Single Digital Gateway*[51] in 2023-2024. Thus, the starting gap has made Romania remain a *follower* in these initiatives, not a *leader*. However, in the long term, the adoption of common EU standards will help Romania recover some differences, providing it with models tested by others.

8.1. Impact and Results

If we look at the *concrete benefits*, Denmark is already reaping the clear fruits of decades of digitalization: budget savings (service processing costs have dropped drastically through automation and the abandonment of paper – electronic submission has saved tens of millions of euros annually), reduced waiting times for citizens (most applications are resolved faster digitally, some instantly), increased transparency (citizens can see the status of their applications online, access personal data, etc.) and greater trust in the administration. In Romania, the positive impact of digitalization is still limited, being felt punctually (e.g. the ~1 million Ghișeul.ro users have benefited from convenience, and taxpayers using

[50] Ministry of Public Finance, *Instructions for using the online declaration submission service*, the document is available at: https://static.anaf.ro/static/10/Anaf/Declaratii_R/instructiuni/instructiuni 2.6.htm, accessed on 16.02.2025.

[51] The Single Digital Gateway is a European Union initiative that provides a single online access point for citizens and businesses, facilitating access to information, administrative procedures and cross-border digital services in all Member States.

SPV save roads and time). On a large scale, however, the Romanian administration has not become significantly more efficient or more citizen-oriented yet – chronic problems persist (bureaucracy, long resolution times, opacity) that the incipient digitalization has not solved. However, there is the potential that once major projects (interoperability, cloud) are completed, there will be an *accelerated increase* in service quality and citizen satisfaction.

Figure 6. *Comparative table Romania – Denmark*

Aspect	Denmark (Digital Governance)	Romania (E-Government)
Digital Infrastructure	Single digital identity (NemID/MitID), integrated portal (borger.dk), mandatory digital mail	Fragmented initiatives (Ghișeul.ro, SPV), lack of national digital identity
Interoperability	Integrated systems at the national level, once-only principle fully implemented	Lack of interoperability, disparate systems
Citizen Participation	98.5% use of digital services, active engagement through digital platforms	25% use of digital services, limited participation
Innovation	Advanced use of technologies (AI, big data), proactive services	Basic digitalization, no integration of advanced technologies

Source: *figure created by the authors*

The Romania–Denmark comparison highlights a digital maturity gap, but also offers Romania a role model to follow. Denmark demonstrates the importance of long-term vision, coherent investment and user-centricity. Romania is at the beginning of a new cycle of digital transformation, with the opportunity to burn stages using lessons already learned by others and cutting-edge technologies. In the next section, I will analyze in more detail the benefits and challenges of digital transformation in public administration, synthesizing these comparative observations.

9. Conclusions

The process of digitalization of public administration in the European Union represents a central element of the modernization of governance, with profound implications for the efficiency, transparency and quality of services offered to citizens[52]. Through the analysis undertaken in this dissertation, we have high-

[52] SmartCityBlog, *What does E-Government mean*?, 2018, the article is available at: https://smartcityblog.ro/ce-inseamna-e-guvernarea/#:~:text=Guvernarea%20electronic%C4%83%20reprezint%C4%83%20procesul%20de,cet%C4%83%C5%A3enilor%20%C5%9Fi%20eficienzitate%20ap

lighted both the theoretical foundations of e-government and the practical modalities of implementation, highlighting the contrast between the situation in Romania and that in Denmark.

From the perspective of **theoretical foundations**, we have seen that e-government is defined as the use of ICT to reinvent how the administration operates and interacts with the public, to streamline and increase citizen participation. Conceptual models (such as the maturity stages) show us that digitalization is an evolutionary process, moving from basic computerization to integrated (*seamless*) transformation. Contemporary theories emphasize the need to be citizen-centric and integrate technology into modernization strategies to create public value. These principles have also been assumed at the EU level through political declarations (Tallinn, Berlin) and action plans, which have provided a common direction and concrete targets (such as "digital by default" services and the objective of 100% online services by 2030).

The comparative study Romania-Denmark allowed the identification of key factors that influence success in e-government. Denmark shows us the importance of strategic continuity and coherence, of the early creation of a unified digital infrastructure (eID, single portal, digital mail) and the adoption of courageous policies (mandatory electronic interactions) supported by good communication and digital education of the population. The results are remarkable: almost the entire population is active online in their relationship with the state, public services are considered accessible and reliable, and the benefits are seen in the efficiency of governance and citizen satisfaction. On the other hand, the situation in Romania highlights typical obstacles for *late adopters*[53]: lack of initial coordination, fragmented investments, critical infrastructures not yet implemented (national eID, interoperability), low digital skills and reluctance to change. The consequence is a low level of use and trust in digital services, which in turn slows down progress. However, Romania is now at a turning point, benefiting from a strong impetus through PNRR resources and the existence of a clear action plan. If these plans are executed consistently, there is the potential to recover some of the gap, especially since current technologies (cloud, digital identity, AI) allow *rapid qualitative* leaps when implemented correctly.

Recommendations for improving digitalization in European public administration, derived from the above, would be:

The EU must continue support for interoperability and standardization, through legislation (e.g. the future European Interoperability Act) and financial instruments. Pay increased attention to the dissemination of good practices – for example, creating guides and toolkits for less advanced Member States, based on

aratului%20administrative%20apparatus, accessed on 17.03.2025.

[53] *Late adopters* are people or organizations that adopt a technology, innovation, or change late, usually after it has already been tested and accepted by most early adopters.

lessons from countries such as Denmark, Estonia, etc. Also, monitor more closely the achievement of the Digital Compass targets, offering technical assistance where delays persist. A special focus should be placed on the digital skills dimension: without trained citizens and officials, investments in technology risk not being used to their full potential. The EU can facilitate training programs and exchange of experience between administrations (e.g. secondment of experts from Denmark to Romania for specific projects, or partnerships between leading and lagging municipalities).

For **Romania** (and other countries with a similar level): the main recommendation is to maintain consistency in the implementation of the assumed strategies. Major projects (interoperability, government cloud, electronic identity card) must be completed within the established deadlines and then leveraged to create citizen-centric services. **Procedural simplification** is required along with **digitalization** – any IT project should be preceded by a critical review of the administrative process it computerizes (rethinking forms, necessary steps, eliminating redundant requirements). The government should also adopt the "digital implicity" principle by updating the legislation: to ensure that, once the infrastructure is ready, certain services will become online only (with assistance for exceptions), thus forcing a paradigm shift. At the same time, it is essential to invest in **digital education**[54] – perhaps through national digital literacy programs for adults, by introducing digital administrative skills modules in schools (so that young people know how to interact with e-government), and continuous training for civil servants. Another recommendation is to *communicate and promote* the available services: many Romanian citizens do not use e-services either because they do not know about them or do not trust them. Public demonstration campaigns (such as "video guide: how to renew your driving license online in 10 minutes") could visibly increase usage. Finally, Romania should work closely with leading countries (including Denmark) – through joint pilot projects, and partnerships within EU programs (CEF Digital, Digital Europe, etc.) – to import not only technology but also organizational know-how.

For **Denmark** (and other leaders): continue to innovate and share the experience gained. Their next challenges are related to the integration of new technologies (AI, robotic process automation – RPA) in the provision of public services and to addressing ethical issues (the use of AI in administrative decisions must be done with caution and transparency). Digital leaders could also support more European govtech initiatives and cross-border experiments – for example, testing the *European Digital Identity Wallet* in real interactions between Denmark and other countries, creating pilot services accessible to citizens of other

[54] Li Yuan, Stephen Powell, *MOOCs and Open Education: Implications for Higher Education*, JISC CETIS, 2013, p. 4, https://publications.cetis.org.uk/wp-content/uploads/2013/03/MOOCs-and-Open-Education.pdf, accessed on 17.03.2025.

states (a Dane could access Romanian services with his eID and vice versa), which would materialize the vision of the *single European digital path*.

Finally, it should be emphasized that the digital transformation of public administration is a long-term process, which involves not only the implementation of technologies but also the evolution of organizational culture and societal behavior. Success is not measured only in the number of online services created, but especially in the added value that citizens feel in their daily lives about the state – be it in time saved, the transparency of decisions, or the feeling of empowerment in interacting with authorities. The European Union, through collective effort, is moving towards a new stage in governance, in which administration will not only be digitalized, but digital-native, designed around technology and the needs of the citizens. The comparison between Romania and Denmark shows us that although the starting points differ, the direction is common, and the benefits are worth the investment: a more efficient government, closer to citizens and prepared for the challenges of the future.

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