

E-Government in Romania and Estonia: Comparative Analysis and Future Directions

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Abstract: Integrating information and communication technology (ICT) in governance has become essential for modern states in the digital age. This paper explores the development and impact of e-government in Romania, analyzing the context and political frameworks. The study highlights the key milestones and strategic initiatives adopted by Romania, providing a comparative analysis with Estonia, a recognized leader in the field of e-government. The research provides recommendations for further improvements and explores future trends and perspectives, highlighting the effect of emerging technologies, such as blockchain and artificial intelligence.

Keywords: e-governance, digital transformation, e-government, Romania, Estonia.

INTRODUCTION

Integrating information and communication technology (ICT) in governance has become essential for modern states in the digital age. E-government is a critical component of the digital transformation and it refers to using ICT in governance in ways that lead to genuinely different structures or processes, the consequence of which may be a more significant effect or modification of public norms and values (Bannister & Connolly, 2012).

This paper aims to explore the evolution and impact of e-government in Romania. It delves into the context and political frameworks that guided Romania's digital transformation, highlighting key milestones and strategic initiatives.

In addition, this research makes a comparative analysis between Romania, a country that has proposed a rapid digital transformation, and Estonia, a recognized leader in e-government. The strengths and weaknesses of each country's digital initiatives are highlighted by examining key indicators, and recommendations for further improvement are provided. The analysis also explores future trends and perspectives, considering the probable effect of emerging technologies such as blockchain and artificial intelligence.

Finally, limitations of the current study, including data availability and methodological constraints, are discussed, and areas for future research are suggested. This comparative study highlights the critical role of strategic investment, effective policy implementation and citizen engagement.

The experiences of Estonia and Romania offer helpful insights for policymakers, practitioners and researchers in digital governance.

BACKGROUND AND EVOLUTION OF ROMANIA

First steps (2001-2006)

Romania's e-governance journey began in 2001 with the adoption of Law No. 544/2001, which ensures free access to public information. This was fundamental in promoting transparency and citizens' access to government information. In 2002, the National Communications Regulatory Authority (ANRC) was established to streamline regulations and improve ICT infrastructure (OUG 79/2002). Until 2003, Romania launched the e-governance portal „e-guvernare.ro”, defined as the portal for access to electronic government services and administrative forms in electronic format of the central public administration is the information system of public utility (Law No. 161 /2003). The Virtual Payments Office was launched in 2006, facilitating online payments for contravention fines, marking a significant step towards integrating financial transactions into e-government services (Law No. 353/2006).

Major projects and expansions (2007-2013)

In 2008, the government launched several new projects, including the „nomenclator.ro” portal (now unavailable) for managing classified lists and the „eDonatii.mcti.ro” portal (currently non-functional) for IT equipment donations. The Virtual Payments Office has been expanded to include electronic payments for various services. The „eRomania” project was started in 2009, which aimed to provide comprehensive online services for citizens and businesses, including paying taxes and issuing legal documents. In 2011, the giseul.ro platform was launched to facilitate online payments for taxes and fees. In 2013, the Virtual Private Space (SPV) service was launched for individuals, aiming to inform citizens about tax obligations, taxation decisions or social security contributions.

Strategic initiatives (2014-2015)

In 2014, the „National Strategy regarding Digital Agenda for Romania 2014-2020” was published, aligning Romania's ICT development with the European Digital Agenda and encouraging economic growth through digital transformation. A grant from the United States Trade and Development Agency – USTDA funded the establishment of a Cyber Security Innovation Center in Romania, which aimed to improve cybersecurity infrastructure and training.

Evolutions between 2015-2024

From 2015 to 2016, Romania focused on improving online public services with strategic initiatives. During this period, the implementation of the „National Strategy regarding Digital Agenda for Romania 2014-2020” continued, which aimed at integrating various public administration systems and ensuring secure data exchange. Between 2017 and 2019, Romania launched digital services to facilitate interactions between citizens and public institutions - Private Virtual Space (SPV) for legal entities - and improved broadband infrastructure.

The 2020 COVID-19 pandemic has accelerated digital transformation, leading to the expansion of e-health services and digital education platforms. In 2021, the government developed mobile applications for administrative tasks, improving the user experience and accessibility of digital services.

In the period 2022 - 2023, Romania began to integrate emerging technologies such as blockchain - the project of National Infrastructure of Distributed Technologies (National Network of Blockchain - RNB), approved by the General Secretariat of the Government, project carried out by ICI Bucharest (2022), and artificial intelligence (AI) – ION, the first AI honorary advisor of the Government, which helps Romanians to be represented more effectively at the administrative level by taking over and reporting their messages, wishes and problems with the help of artificial intelligence (ION, 2022)). At the same time, in 2023, the financing contract was signed for the realisation of the

governmental cloud and the migration of the IT systems of the Romanian state (M.C.I.D., 2023).

Radu et al. (2022) argues that digitalization reform in Romania represents a significant transition to a new paradigm encompassing technological, informational, and social dimensions. Romania's e-government initiatives from 2001 to 2024 reflect a sustained effort to integrate ICT into public administration, improve service delivery and increase citizen engagement through digital platforms. The country continues to build on these foundations with ongoing projects to modernise its digital infrastructure and expand the reach and efficiency of its e-government services.

COMPARATIVE ANALYSIS ROMANIA-ESTONIA

Estonia is widely recognized as an international leader in e-government, having implemented a comprehensive and integrated

digital infrastructure that has transformed public administration and citizen services. This chapter provides a comparative analysis of Romania's and Estonia's e-government initiatives to identify best practices and potential areas for improvement in Romania's digital strategies.

E-government ranking

The e-Government ranking reflects countries' overall position regarding their e-Government Index (Figure 1), where a lower number indicates better performance. Estonia has consistently maintained a high place in the global e-government rankings, consistently ranking in the top 20 countries from 2003-2022. The data shows a general trend of improvement or retention at the top, reflecting Estonia's continuous efforts to innovate and improve its digital services.

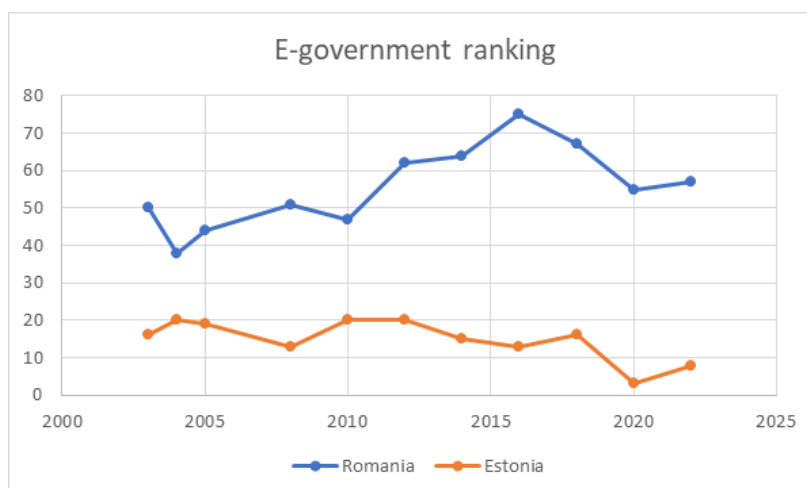


Figure 1. Comparative Analysis Romania - Estonia: E-government Ranking

Romania's e-government position was less impressive than Estonia's, with Romania often outside the top 50, indicating room for significant improvement. There are signs of progress over the years, with the best evolution between 2018-2020, with the pandemic bringing our country from 67th to 55th place, thus noting

efforts to improve e-government services. Considering the fluctuations in Romania's chart, inconsistency is reported in developing and implementing e-government initiatives.

Estonia's consistently high performance demonstrates its effective digital governance strategy and robust infrastructure.

The country has maintained its leading position in e-government. At the same time, Romania faces challenges in reaching higher positions, with fluctuations and slower improvements compared to Estonia. This points to the need for a more cohesive and strategic approach to digital governance.

E-Government Index

The e-government index (EGI – Figure 2) measures the efficiency of government online services and the general digital environment. A higher EGI reflects a better performance in providing public services through digital platforms.

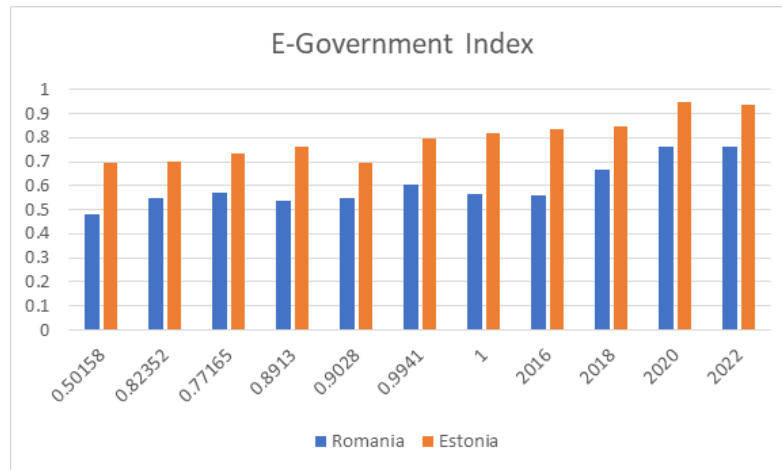


Figure 2. Comparative Analysis Romania – Estonia: E-Government Index

Estonia demonstrates a strong and consistent performance in terms of EGI. As early as 2003, Estonia's e-government index was 0.6968, already indicating a solid base. Subsequently, from 2004 to 2022, Estonia's e-government index has steadily increased, reaching a peak of 0.9473 in 2020. This steady growth reflects continuous investment and improvements in digital services. At the same time, considering that the highest value of the index was recorded in 2020, it highlights Estonia's efforts in improving e-government services, especially during the COVID-19 pandemic, when digital services became crucial.

While showing an improvement, the EGI data for Romania lags behind Estonia's performance. In 2003, Romania's e-government index was 0.48278, significantly lower than Estonia's, indicating a weaker starting point. However, from 2004 to 2022, Romania's e-government index gradually improved, reaching 0.7619 in 2022.

Although this shows progress, the improvement rate is slower compared to Estonia.

Over the years, there has been a clear and consistent gap between EGI values in Romania and Estonia, reflecting the disparity in developing and implementing digital services. Estonia started with a higher EGI index in 2003 and has maintained this advantage over the years, showing the benefits of early investments in digital governance. Estonia's steady and significant improvements in its e-government index demonstrate a well-executed and continuous strategy to improve digital services.

Electronic Participation Index

The e-Participation Index (EPI – Figure 3) measures the quality and extent of online services available to citizens, focusing on e-information, e-consultation and e-decision-making. A higher EPI reflects better citizen engagement and participation through digital means.

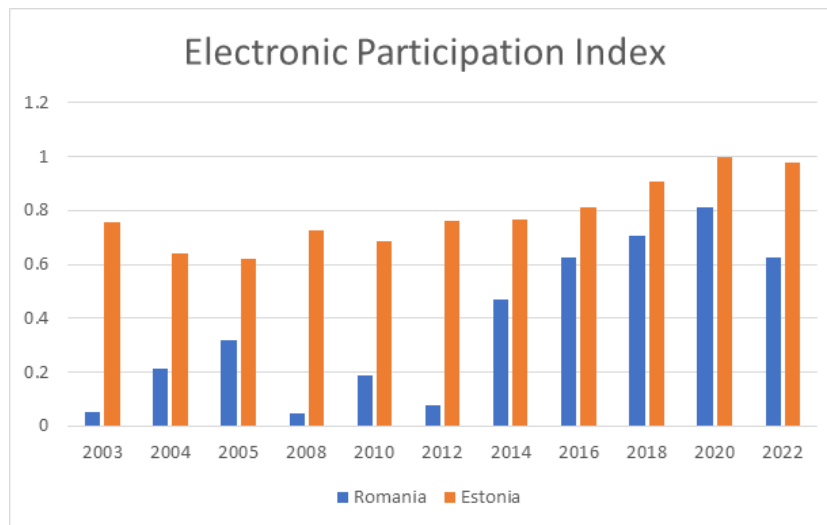


Figure 3. Comparative Analysis Romania – Estonia: Electronic Participation Index

Estonia demonstrates a strong and consistent performance on the e-Participation Index. In 2003, Estonia's e-participation Index was 0.7586, indicating a solid foundation for citizen engagement through digital platforms. Although Estonia's EPI shows a slight fluctuation over the years, it remains relatively high from 2003 to 2010. As of 2012, Estonia's EPI remains high, reflecting continuous improvement and stability.

Romania's e-participation Index shows significant improvements over the years, but it starts from a much lower base compared to Estonia in 2003, registering a value of 0.05170 and indicating the limited involvement of citizens through digital means at the beginning. Romania's EPI shows a steady improvement between 2004 and 2010. After 2012, Romania's EPI shows more substantial increases, reflecting efforts to improve electronic participation.

Estonia's high e-Participation Index values indicate a well-established system for citizen engagement through digital platforms. The steady performance after 2012 shows that Estonia has successfully maintained its e-participation capabilities. Although starting from a much lower base, Romania has significantly improved its e-participation Index, especially in recent years. This reflects Romania's efforts to increase citizens' involvement in the digital environment. Despite improvements, a consistent gap remains, highlighting the difference in maturity and effectiveness of e-participation mechanisms.

Online Services Index

The Online Services Index (OSI – Figure 4) measures the scope and quality of online services provided by the government. A higher OSI indicates a better performance in delivering digital public services.

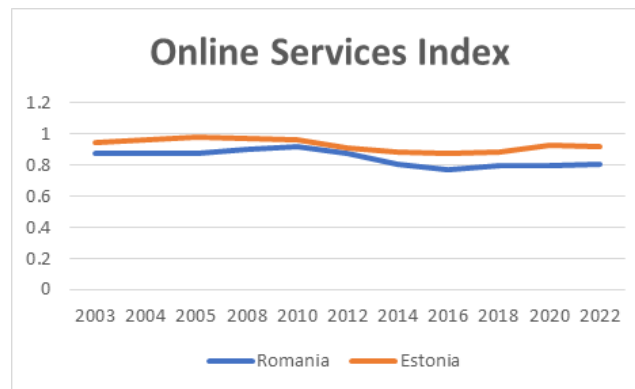


Figure 4. Comparative Analysis Romania – Estonia: Online Services Index

In the case of this index, Estonia has demonstrated a strong and consistent performance since 2003, its value being 0.64192, thus indicating a solid foundation for the provision of online services. Although it showed occasional growth and fluctuations during 2003-2010, as of 2012, Estonia's OSI reflects continued improvement and stabilization.

In the case of Romania, a gradual improvement can be seen over the years, starting from a smaller base compared to Estonia. In 2003, Romania's OSI was 0.14914, indicating limited online service capabilities. However, in the period 2003 – 2010, the values acquired a consistent upward trend. After the year 2012, efforts to improve online services were observed.

High and relatively stable OSI values in the case of Estonia indicate a well-developed system for providing online services. The steady performance after 2012 highlights Estonia's ability to maintain and improve its offerings. At the same time, Romania showed a significant improvement in this index, especially in recent years. However, despite the upgrades recorded, a consistent gap remains between Estonia's and Romania's values.

Online Services Index

The Human Capital Index (HCI – Figure 5) measures the level of education, skills and health of a country's workforce. A higher HCI indicates better human capital, which is essential for economic growth and development.

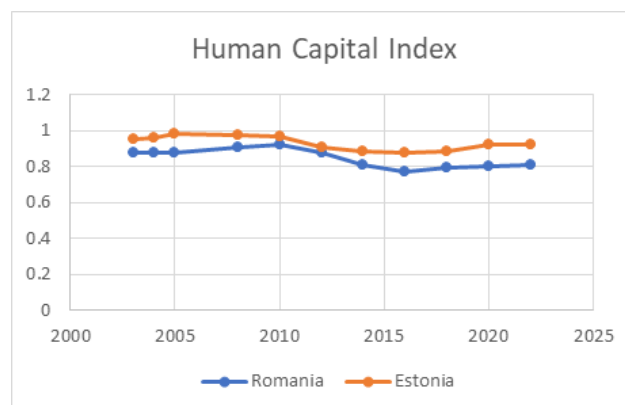


Figure 5. Comparative Analysis Romania – Estonia: Human Capital Index

Data for Estonia show a high and relatively stable human capital index, with the country's HCI reflecting a well-educated and healthy

workforce. For example, in 2003, the HCI was 0.95 and increased slightly to 0.96 in 2004 and 0.98 in 2005. This indicates a solid and

continuous investment in human capital development. Although there have been minor fluctuations, since 2018, Estonia's HCI has remained remarkably stable at 0.97468, reflecting sustained efforts to maintain high education and health services standards.

Romania's Human Capital Index also shows high values but with more visible variations compared to Estonia. Starting from 0.83333 in 2003, it rose steadily to 0.86190 in 2004 and 0.88095 in 2005. This upward trend highlights Romania's commitment to improving human capital, although it started from a lower base. Starting with 2012, HCI in Romania has shown a significant improvement. The index increased from 0.88571 in 2012 to 0.94762 in 2016, reaching 0.96667 in 2022. This substantial increase demonstrates Romania's continuous efforts to improve human capital.

Estonia maintains a high and relatively stable human capital index, reflecting consistent investments in education and health. This stability indicates a mature system that effectively supports human capital

development. Romania has significantly improved over the years, although HCI values are slightly more variable than Estonia. The visible upward trend, especially after 2012, highlights Romania's efforts to catch up with the top nations regarding human capital. However, the variations suggest areas that could benefit from further stabilization and consistency in policy implementation. Both countries demonstrate a strong commitment to human capital development, but Estonia's consistently high performance provides a model of sustained success, while Romania's rapid improvements highlight its potential to catch up.

Telecommunications Infrastructure Index

The Telecommunications Infrastructure Index (TII – Figure 6) measures the quality and extent of telecommunications infrastructure, including the Internet and mobile networks, essential for supporting digital services and connectivity. A higher TII reflects a better infrastructure supporting digital services.

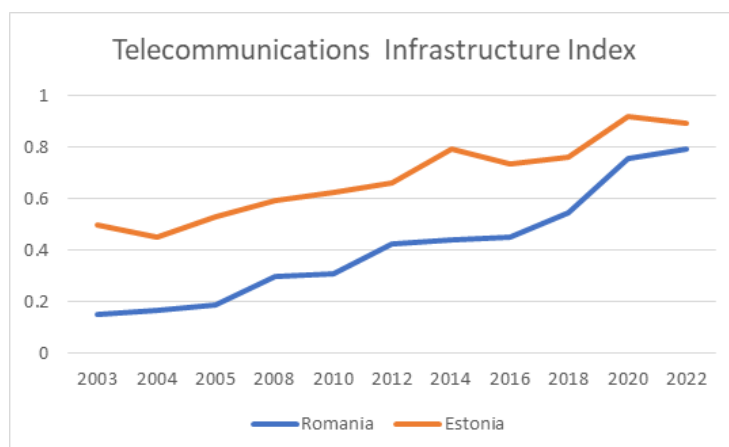


Figure 6. Comparative Analysis Romania – Estonia: Telecommunications Infrastructure Index

Estonia once again demonstrates a strong and consistent performance in the Telecom Infrastructure Index. In 2003, Estonia's TII was 0.49849, indicating a solid foundation in telecommunications infrastructure. This early start in developing robust telecommunications systems has been a key factor in Estonia's

digital success. In 2003 – 2010, Estonia's TII showed steady growth over the years, reflecting continuous investment in improving both the coverage and the quality of telecommunications services. After 2012, Estonia's TII values reflect continuous improvement. The significant growth of TII in these years underlines Estonia's

commitment to maintaining high standards in digital infrastructure, supporting its e-government and e-participation initiatives.

Romania's telecommunications infrastructure index showed significant improvements over the years, but it started from a lower base compared to Estonia in 2003, Romania's TII having a value of 0.14914, indicating that telecommunications infrastructure was initially limited. This low initial value reflects Romania's challenges in developing its digital infrastructure. However, Romania's TII has shown a consistent upward trend over the years, highlighting Romania's efforts to gradually improve its telecommunications infrastructure.

After 2012, the index shows an obvious improvement, almost doubling in ten years, thus demonstrating Romania's commitment to reducing the digital divide and improving its connectivity to support various digital services.

Estonia's solid and consistent performance in the Telecommunications Infrastructure Index highlights its success in developing and maintaining a robust telecommunications infrastructure. This solid foundation supports its leading position in digital services and e-governance. The continuous improvement and high TII values reflect Estonia's strategic investments in technology and connectivity.

Instead, Romania's gradual improvement underscores the need for continued efforts to improve its digital connectivity. Starting from a lower base, Romania has made significant progress, especially after 2012, in developing its telecommunications infrastructure. These improvements are crucial for supporting the country's digital services and closing the gap with more advanced countries like Estonia.

While both countries have seen improvements, Estonia's early start and consistent investment have established it as a leader in telecommunications infrastructure, while Romania is on a positive trajectory of development and recovery. However, despite the improvements registered by Romania, there remains a consistent gap between the TII values of Estonia and Romania. This gap highlights the difference in the maturity and effectiveness

of their telecommunications infrastructures. Estonia's more advanced and mature infrastructure supports its leading position in digital services, while Romania continues to develop and improve its infrastructure.

According to the Digital Decade 2024 report (European Commission, 2024), Estonia is one of the leaders in digital public services, thanks to efficient online platforms that simplify interactions for both citizens and businesses. Romania, although has made significant progress in the digitalization of public services (creating the framework for the government cloud and the interoperability portal), the overall provision of public services needs persisted focus to achieve the objectives of the Digital Decade.

FUTURE TRENDS AND PERSPECTIVES

Romania has made significant progress in digital governance, and the country has the potential to improve its digital capabilities further. Romania is expected to accelerate digital transformation efforts to catch up with leading countries such as Estonia. This involves increasing investment in digital infrastructure, expanding broadband access and ensuring that digital services are available to all citizens, especially in rural and disadvantaged areas.

Moreover, Romania can benefit from an integrated approach to digital services. Creating unified platforms where citizens can access multiple services through a single portal can improve user experience and efficiency. Continued policy and governance reforms will be crucial for digital progress. This includes streamlining regulatory frameworks, reducing bureaucratic obstacles, and promoting an environment that is facilitative to innovation and digital entrepreneurship.

To support digital transformation, Romania must invest in education and skills development. This includes updating the education curriculum to include digital literacy and advanced IT skills and providing training and upskilling opportunities for the current workforce.

The involvement of the private sector via public-private collaborations can stimulate

innovation and investment in digital infrastructure and services. Partnerships with technology companies, startups and academic institutions can help Romania use both the latest technologies and expertise.

As digital services expand, Romania needs to strengthen its cyber security infrastructure to protect against cyber threats. Implementing robust cybersecurity protocols, investing in security technologies, and promoting public awareness in this area are essential steps.

Encouraging greater citizen engagement through digital platforms will be important for Romania. This can be achieved by making e-participation more accessible, user-friendly and responsive to citizens' needs. Interactive platforms for public consultation, feedback and decision-making can increase transparency and trust in government.

Moreover, Romania's e-government initiatives face several challenges, including issues related to interoperability, data sharing and digital inclusion. The lack of a fully integrated digital infrastructure prevents the seamless exchange of information between government agencies, reducing the efficiency of public services.

While Estonia continues to be a world leader, Romania's efforts to improve its digital governance may lead to convergence in the performance of both countries. Through exchanging knowledge and joint projects, Estonia and Romania's collaboration can accelerate Romania's progress and provide mutual benefits. Estonia will likely maintain its role as a digital leader in the region, setting benchmarks for other countries. Romania has the potential to evolve into a regional leader in digital transformation if it continues its upward trajectory and successfully implements its digital strategies.

However, both countries will face common challenges such as cyber security threats, data privacy concerns and the need for continuous innovation. Developing innovative solutions to these challenges can set new standards in digital governance and provide role models for other countries.

For example, the eIDAS (Electronic Identification, Authentication and Trust Services) regulation is

an EU framework established in 2014 to enable secure electronic interactions by standardizing digital identification and trust services across member states. According to Lips et al. (2020), even Estonia, a leader in digital governance, encountered challenges with this regulation, including regulatory compliance issues and varying interpretations across countries. Thus, the need arose for improved cross-border interoperability and a refined legal framework to support seamless digital identification processes.

Romania, while making progress in implementing an eIDAS Interoperability Node, which aims to connect Romania's electronic identity providers and public service portals with the eID systems of other EU states, has faced common challenges in ensuring complete technical and political alignment with EU protocols. In practice, the main issue has been maintaining seamless interoperability between the unique eID systems of different member states, while maintaining national standards and security requirements, similar to the challenges faced by Estonia. (RO eIDAS, 2024).

Another trend emerging in recent years concerns the adoption of blockchain, exploring the potential of this technology to improve security and efficiency in eGovernment. A successful example is the implementation of KSI Blockchain in Estonia, which ensures security and privacy at the national level. KSI is a massively scalable alternative to public key infrastructure (PKI) and, in 2020, became the first eIDAS-accredited blockchain system, the EU standard for electronic transactions. With KSI, Estonian authorities benefit from an impenetrable platform for data manipulation, ensuring public trust in the security and integrity of government information. (Dumitrache et al., 2022)

Stoica & Ghilic-Micu (2020) argue that the transition to e-government faces significant challenges, especially in gaining public acceptance and ensuring adequate training for civil servants. Successful implementation requires cutting red tape through better interdepartmental connections and establishing a solid legal framework to support e-services. Privacy concerns require strict

measures to protect citizens' personal data and combat cybercrime. While the transition to e-government is inevitable, it is essential to execute it carefully to avoid wasting resources and build public trust in digital systems.

Dumitrache et al. (2023) underlines that Romania possesses the opportunity to leverage artificial intelligence in e-government applications to enhance public services and increase citizen engagement. By effectively addressing challenges, promoting a collaborative atmosphere, and adhering to ethical standards, Romania can position itself as a prominent digital leader in Europe. Through a user-centered approach and continuous adaptation, the nation can fully realize the benefits of digitization and artificial intelligence for the advantage of its citizens and society at large.

Future trends and perspectives for Estonia and Romania highlight the dynamic nature of e-government. Continuous innovation sets a high standard, while Romania's significant progress and potential for accelerated transformation point to a promising future. By focusing on strategic investments, policy reforms and citizen engagement, both countries can improve their digital capabilities and contribute to the global advancement of digital governance. Cooperation, knowledge sharing and a dedication to innovation will be key success factors in this evolving digital landscape.

CONCLUSIONS

The comparative analysis between Estonia and Romania in terms of e-government, based on various indices, highlights significant differences in their progress and the current ranking. Estonia has established itself as a global leader in digital governance through early investment, strategic planning and continuous innovation. The country's consistent high performance in key indices such as the E-Governance Index, e-Participation Index,

Online Services Index, Human Capital Index and Telecommunication Infrastructure Index demonstrates a robust digital infrastructure that supports effective e-services governance, high citizen engagement and a strong human capital base.

In contrast, although starting from a lower base, Romania has made significant progress in recent years. Improvements in these indices reflect its commitment to digital transformation and modernization. However, Romania still faces challenges closing the gap with leading nations such as Estonia. The review highlights the importance of strategic investments, policy reforms and continued efforts to improve digital capabilities.

To further improve its e-government capabilities and bridge the gap, Romania should focus on investing in digital infrastructure, integrating and simplifying digital services, improving cyber security measures, digital literacy, promoting private-public partnerships, developing electronic participation and citizen involvement, and monitoring and evaluating progress.

The analysis is constrained by the availability and quality of historical data for both Estonia and Romania. Inconsistent or incomplete data for specific years can affect the accuracy of analysis and trend comparisons. Moreover, the indexes used provide an overall picture but may not have the granularity necessary to capture all specific nuances and improvements.

This research focuses exclusively on Estonia and Romania, which limits the generalizability of the findings. Including a broader range of countries could provide a more comprehensive understanding of global digital governance trends and best practices.

Recognizing these limitations is essential for contextualizing the findings and guiding future research efforts. Future studies should seek to address these limitations by incorporating more comprehensive data, using advanced analytical methods, and considering a more extensive range of influencing factors.

REFERENCE LIST

- Bannister, F. & Connolly, R. (2012) Defining e-Governance. *E-Service Journal*. 8(2), 3–25. doi:10.2979/eservicej.8.2.3
- Dumitrache, M., Stănescu, A.C. & Paraschiv, E.A., (2023) Digitalization and artificial intelligence in e-Government applications. *Romanian Journal of Information Technology and Automatic Control*, ISSN 1220-1758, 33(3), pp. 43-54, 2023. doi: 10.33436/v33i3y202304
- Dumitrache, M., Sandu, I.E., Rotună, C.I. & Cohal, A. (2022) Blockchain-era eGovernment services. *Romanian Journal of Information Technology and Automatic Control*. 32(1), 7-18. doi:10.33436/v32i1y202201
- European Commission (2024) Digital Decade 2024 report: Country fact pages. <https://digital-strategy.ec.europa.eu/en/factpages/digital-decade-2024-report-country-fact-pages> [Accessed October 16th 2024]
- ICI București (2022) *National Infrastructure of Distributed Technologies (National Network of Blockchain - RNB)*. <https://ici.ro/ro/anunturi/ici-bucure%C8%99ti-lanseaz%C4%83-proiectul-de-infrastructur%C4%83-na%C8%9Bional%C4%83-de-tehnologii-distribuite-re%C8%9Beaua-na%C8%9Bional%C4%83-de-blockchain-rnb/> [Accessed August 30th 2024]
- ION (2022) *Artificial Intelligence (AI) – ION*. <https://ion.gov.ro/> [Accessed August 29th 2024]
- Law No. 161/2003, <https://legislatie.just.ro/Public/DetaliiDocument/43323?isFormaDeBaza=True&rep=True> [Accessed August 29th 2024]
- Law No. 353/2006, <https://legislatie.just.ro/Public/DetaliiDocumentAfis/73752#?> [Accessed August 29, 2024]
- Law No. 544/2001, <https://legislatie.just.ro/Public/DetaliiDocument/31413?isFormaDeBaza=True&rep=True> [Accessed August 29th 2024]
- Lips, S., Bharosa, N. & Draheim, D. (2020). eIDAS Implementation Challenges: The Case of Estonia and the Netherlands. In: Chugunov, A., Khodachek, I., Misnikov, Y., Trutnev, D. (eds) *Electronic Governance and Open Society: Challenges in Eurasia*. EGOSE 2020. Communications in Computer and Information Science, vol 1349. Springer, Cham. https://doi.org/10.1007/978-3-030-67238-6_6
- Ministry of Research, Innovation and Digitalization (2023) Cloudul guvernamental primul pas pentru interoperabilitatea sistemelor informatice. <https://www.mcid.gov.ro/cloudul-guvernamental-primul-pas-pentru-interoperabilitatea-sistemelor-informatic-e> [Accessed August 29th 2024]
- National Strategy regarding Digital Agenda for Romania 2014 – 2020 (2014) <https://www.juridice.ro/wp-content/uploads/2014/12/Strategia-Nationala-AD.pdf> [Accessed August 28, 2024] OUG 79/2002, <https://legislatie.just.ro/Public/DetaliiDocument/82405?isFormaDeBaza=True&rep=True> [Accessed August 28th 2024]
- Radu, A.F., Petcu, I. & Barbu, D.C., Privacy and Security - Related Challenges of the Future EU Digital Identity, *Romanian Cyber Security Journal*, ISSN 2668-6430, vol. 5(1), pp. 39-52, 2023. <https://doi.org/10.54851/v4i2y202205>
- RO eIDAS (2024) *Nodul e IDAS românesc*. <https://eidas.gov.ro/roeidas/> [Accessed October 16th 2024]
- Stoica, M. & Ghilic-Micu, B. (2020) E-Government in Romania – a Case Study. *Journal of e-Government Studies and Best Practices*. ID 608643, pp. 1-12. doi:10.5171/2020.608643.
- United Nations (2024) *UN E-Government Knowledgebase?* <https://publicadministration.un.org/egovkb/en-us/Data-Center> [Accessed September 24th 2024]



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