



A Review of E-Government Practices in the Age of Digitalization

**Abdul Wajid Fazil^{1*}, Musawer Hakimi², Sebghatullah Aslamzai³,
Mohammad Mustafa Quch⁴**

Assistant Professor at Department of IS, Badakhshan University, Afghanistan¹

Assistant Professor at Department of Computer Science, Samangan University, Afghanistan²

Associate Professor at Faculty of Computer Science, Kabul University, Afghanistan³

Assistant Professor at Department of Network Engineering, Faryab University, Afghanistan⁴

Corresponding Email: wajid@badakhshan.edu.af*

Received: 05-01-2024

Reviewed: 10-01-2024

Accepted: 09-02-2024

Abstract

The landscape of digital governance is rapidly evolving, with E-Government practices playing a pivotal role in reshaping administrative processes and citizen engagement. Central to this evolution are the challenges, successes, and regional dynamics that influence the implementation of E-Government initiatives, particularly in Central and Eastern European (CEE) nations. This study aims to investigate the intricate dynamics of E-Government practices, focusing on the digitalization efforts in EU states, the challenges and successes in implementing E-Government in CEE nations, and the utilization of research on E-Government clusters and maturity models by policymakers. A comprehensive research methodology is employed, incorporating systematic literature reviews, quantitative analysis of benchmarking data, and in-depth case study examinations. Key sources include authoritative publications such as the Digital Economy and Society Index (DESI), E-Government Benchmark reports, and seminal works by researchers in the field. Data extraction and synthesis are conducted to identify trends, patterns, and key insights related to digital governance and E-Government practices. The findings reveal significant progress in digitalization efforts across EU states, with disparities in E-Government maturity levels persisting between countries. Challenges in CEE nations include institutional fragmentation, bureaucratic inefficiencies, and limited resources, while successes underscore the transformative potential of innovative strategies. Policymakers' utilization of research on E-Government clusters and maturity models holds promise for evidence-based decision-making and policy formulation. In conclusion, this study offers valuable insights into the multifaceted nature of digital governance and E-Government practices. By synthesizing findings from diverse sources, it contributes to a deeper understanding of regional dynamics, challenges, and opportunities in the realm of E-Government. These insights pave the way for evidence-based policymaking, informed discourse, and future research endeavors in the dynamic terrain of digital governance.

Keywords: E-Government, Digitalization, Digital Governance, User-Centric, Policy, Digital Divide, Cybersecurity

Introduction

In the dynamic landscape of public administration, the pervasive influence of digitalization has catalyzed a paradigm shift, ushering in a new era of E-Government practices. As we traverse the intricate tapestry of the digital age, the convergence of governance and technology stands as a cornerstone, redefining efficiency, transparency, and citizen engagement. This comprehensive review embarks on a meticulous exploration of recent developments and scholarly insights into E-Government practices, shedding light on the multifaceted terrain shaped by the relentless march of digitalization.

E-Government, emblematic of leveraging electronic systems and digital platforms to enhance public service delivery and administrative processes, finds itself at the nexus of technological innovation and governance reformation. Van der Linden (2021) provides a foundational framework, articulating a four-stage model that delineates the progressive evolution of E-Government. This model proves instrumental in understanding the iterative stages governments navigate to achieve fully functional digital governance.

The scholarly landscape witnesses a heightened focus on the global experiences of E-Government implementation, with Heeks (2006) and Schuppan (2009) offering invaluable insights. Their research illuminates the diverse challenges and successes encountered, especially in the context of developing nations. These works serve as beacons, guiding policymakers and researchers through the complexities of managing and implementing E-Government initiatives.

In the context of twenty-first-century governance challenges, the Internet emerges as a vital tool for fostering citizens' trust and promoting transparency in government operations. Recent years have witnessed an expansion of European Union local governments' online presence, reflecting a shift towards customer-oriented service delivery. Torres et al. (2006) offer empirical insights into e-governance initiatives in European cities, providing valuable benchmarks for cities seeking to assess and enhance their online governance strategies. Recent research by Hakimi et al. (2024) offers a comprehensive analysis of human factors in cybersecurity, elucidating the intricate interplay between human behavior, cognition, and technology. Their study underscores the imperative of understanding these factors holistically to effectively tackle cybersecurity challenges amidst increasing digitalization and remote work environments.

Furthermore, leveraging advanced technologies such as Blockchain, Artificial Intelligence, Augmented Reality, and the Internet of Things, the research illuminates their transformative impact on operational efficiency, productivity, and financial profitability within Afghanistan's tourism sector (Hakimi et al., 2023). Through empirical analysis and strategic recommendations, the study not only facilitates informed decision-making but also lays the groundwork for sustainable industry growth. Similarly, their exploration of E-Banking trends

A Review of E-Government Practices in the Age of Digitalization

and impacts sheds light on the transformative potential of digitalization within the country's banking sector. With meticulous analysis and practical insights, the research underscores the pivotal role of technological innovation and regulatory frameworks in shaping the future of financial services.

E-government and E-participation serve as pivotal avenues for enhancing public administration systems and facilitating participatory decision-making processes. Despite considerable investments in information and communication technologies (ICT) by governments worldwide, there persists a notable gap in effectively addressing the needs of constituents. Peristeras et al. (2009) underscore the necessity of redirecting government efforts towards citizens and businesses, providing models, technologies, and tools to optimize public administration systems and foster inclusive decision-making. In their seminal contribution, Hwang et al. (2004) meticulously explore the multifaceted challenges confronting e-government initiatives, with a particular focus on the critical aspect of information security. Through a comprehensive analysis, they illuminate the intricate interplay between e-government implementation and the safeguarding of sensitive information. Within the European context, the Digital Economy and Society Index (DESI) reports for Czechia and Slovakia emerge as crucial benchmarks, offering quantitative assessments of digitization performance. These reports, emanating from official European Commission publications, provide nuanced insights into the progress and challenges faced by individual member states on their digitalization journeys.

Intricacies of citizen-centric E-Government development are brought to the forefront by Špaček, Csótó, and Urs (2020), who question the genuine citizen-centricity of digitalization efforts in Central and Eastern European countries. Their critical examination aligns with the United Nations' E-Government Survey (2020), emphasizing the pivotal role of digital governance in the broader context of sustainable development. As we traverse this comprehensive review, synthesizing insights from diverse studies, the aim is to offer a holistic perspective on the state of E-Government practices amidst the relentless tide of digitalization. By critically engaging with seminal studies, benchmarking reports, and comparative analyses, this article aspires to contribute substantively to the evolving discourse on the intricate interplay between technology and governance. This contribution is poised to guide future research endeavors and inform policymaking in the ever-evolving terrain of digital governance.

Literature Review

The period from diverse study has witnessed an unprecedented surge in research dedicated to unraveling the intricate nuances of E-Government practices. This literature review aims to provide a comprehensive synthesis of key contributions, offering insights into the evolution, challenges, and innovations within the realm of digital governance.

Evolution of E-Government

Heeks' (2006) seminal work on implementing and managing E-Government establishes a foundational understanding of the evolution of digital governance. His insights highlight the

importance of strategic planning and effective management, emphasizing their imperative roles in ensuring the success of E-Government initiatives. This foundational piece remains pivotal for administrators and policymakers as they navigate the complexities of digital transformation, providing essential guidance for informed decision-making in the realm of digital governance.

Multifaceted Landscape of E-Government

The impact of the digital divide on e-government use has garnered significant scholarly attention, with studies by Belanger & Carter (2009) and Ebbers et al. (2016) delving into its complexities. These investigations shed light on how digital inequalities affect various stages of e-government development, as highlighted in the research by Dodel & Aguirre (2018).

Damascene and Andersson (2019) conducted a comprehensive literature review, elucidating the public value derived from e-government initiatives and stressing the importance of understanding their societal impact. In parallel, the European Commission (2021) has recognized the pivotal role of e-government in modern governance, as evidenced by its E-Government Action Plan.

Furthermore, research endeavors have explored predictors of e-government services adoption, exemplified by the case study of Russian students in China conducted by Kofi et al. (2017). Additionally, Niehaves, Gorbacheva, and Plattfaut (2012) investigated the persistent influence of socio-demographic variables on e-government use among online populations, highlighting the ongoing relevance of addressing digital divides within e-government initiatives.

In a complementary vein, Fernández-Batanero et al. (2020) contributed to the discourse by examining digital competences essential for teacher professional development. Their study sheds light on the broader implications of digital literacy in various domains, adding depth to the understanding of digital competencies in professional contexts.

Regional Dynamics: A European Perspective

Androniceanu, Georgescu, and Kinnunen (2022) make a significant contribution through their comparative analysis of public administration digitalization and corruption across EU member states. Their study sheds light on the intricate relationship between technological adoption and governance integrity, underscoring the necessity of aligning digitalization strategies with anti-corruption measures. Additionally, in a complementary study, Androniceanu et al. (2020) employ Gaussian Mixture Models to identify E-Government clusters within the EU. This methodological innovation offers a nuanced understanding of the diverse digitalization patterns, providing valuable insights for tailoring strategies to specific regional contexts.

Citizen-Centric Governance in Central and Eastern Europe

The exploration of citizen-centricity in E-Government development gains prominence in the works of Špaček, Csótó, and Urs (2020). By challenging assumptions about the real impact of digital governance on citizens' lives in Central and Eastern European countries, their

A Review of E-Government Practices in the Age of Digitalization

scrutiny of G2C service implementation prompts a reevaluation of the effectiveness of E-Government efforts in genuinely serving citizens' needs and expectations.

Global Perspectives: United Nations' E-Government Survey

On a global scale, the United Nations' E-Government Survey (2020) amplifies discussions by emphasizing the transformative potential of E-Government in the "Decade of Action" for Sustainable Development. The report underscores the need for technology to act as a catalyst for positive societal change, aligning digital governance with broader objectives of sustainable development. This global perspective accentuates the role of E-Government not merely as a technological endeavor but as a force for societal progress.

Methodological Advancements: Benchmarking E-Government

Benchmarking studies, such as those conducted by Tinholt et al. (2017-2018), offer valuable insights into the user-centric design and delivery of digital public services in Europe. These reports serve as benchmarks for evaluating the progress and effectiveness of E-Government initiatives, providing a quantitative lens to gauge the success and areas of improvement in digital service delivery.

To sum up, the literature from various studies paints a dynamic picture of E-Government, highlighting its evolution, regional dynamics, citizen-centric governance, and global implications. As we navigate through this rich tapestry of research, it becomes evident that the interplay between technology and governance is a multifaceted phenomenon, with each contribution adding a layer of understanding to the complex landscape of digital governance.

Research Method

This research aims to delve into the intricate dynamics of E-Government practices, seeking to understand the evolution, challenges, and impact of digital governance from various study. The research methodology employed in this study combines a systematic literature review, quantitative analysis of benchmarking data, and case study examinations to offer a comprehensive perspective on the subject.

The foundation of this research lies in a rigorous literature review, drawing insights from seminal works such as (Heeks, 2006) exploration of implementing and managing E-Government. This initial phase provides a theoretical framework and historical context, setting the stage for a nuanced understanding of the subject. Additionally, regional studies, particularly those by (Androniceanu, Georgescu, and Kinnunen, 2022), and global perspectives like the United Nations' E-Government Survey (2020), contribute diverse viewpoints essential for a holistic analysis.

To supplement the qualitative insights gained from the literature review, a quantitative analysis is conducted using benchmarking data from (Tinholt et al., 2017-2018). The objective is to identify trends, patterns, and key performance indicators in the delivery of digital public services across European countries. This data-driven approach adds a layer of objectivity to the research, allowing for the identification of empirical evidence supporting or challenging the conceptual frameworks established in the literature.

Complementing the broad strokes of the literature review and the quantitative analysis, the research methodology includes in-depth case study examinations. The works of (Špaček, Csótó, and Urs, 2020) provide a framework for assessing the citizen-centricity of E-Government initiatives in Central and Eastern European countries. These case studies delve into the intricacies of local implementations, offering a micro-level understanding of the challenges faced and the outcomes achieved in specific contexts.

The findings from the literature review, quantitative analysis, and case study examinations are synthesized to form a cohesive narrative. This synthesis involves identifying overarching themes, patterns, and contradictions within the collected data. By triangulating insights from multiple sources, the research aims to provide a more robust and nuanced understanding of E-Government practices, acknowledging the complexity inherent in the intersection of technology and governance.

Throughout the research process, ethical considerations are paramount. All data sources, whether from literature or benchmarking studies, are meticulously cited to acknowledge the intellectual contributions of previous works. Moreover, the privacy and confidentiality of individuals and entities involved in case studies are safeguarded, adhering to ethical standards in research. In conclusion, this research methodology adopts a multidimensional approach, combining literature review, quantitative analysis, and case study examinations to unravel the dynamics of E-Government practices. By synthesizing insights from these diverse methods, the study aspires to contribute a nuanced understanding of the subject, fostering informed discourse and guiding future research endeavors.

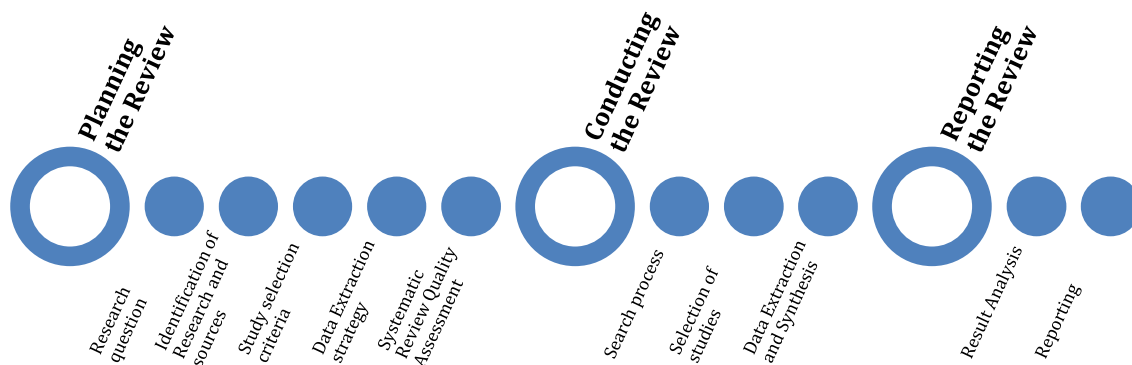


Figure 1: illustration of the sequential steps in the systematic literature review process.

1. Planning the Review

Research Questions

RQ1: How do digitalization efforts in EU states like Slovakia and the Czech Republic compare in terms of e-government maturity and service delivery, as per the Digital Economy and Society Index (DESI)?

A Review of E-Government Practices in the Age of Digitalization

RQ2: What are the main challenges and successes in implementing e-government in Central and Eastern European nations, and how do they inform our understanding of local dynamics in digital governance?

RQ3: How can policymakers use research on e-government clusters and maturity models to develop strategies for improving digital governance and addressing issues like corruption and the digital divide?

Identification of Research and Sources: The review will primarily draw upon scholarly literature, benchmark reports, and national concepts of public administration informatization. Key sources include authoritative publications such as the Digital Economy and Society Index (DESI), E-Government Benchmark reports, and national reports from Slovakia and the Czech Republic. Additionally, seminal works by researchers like Heeks (2006), Androniceanu et al. (2020), and Špaček et al. (2020) will be consulted to provide theoretical frameworks and empirical insights.

Study Selection Criteria: The selection criteria for studies include relevance to e-government practices, focus on digitalization and its impact on governance, geographic relevance to the EU, specifically Slovakia and the Czech Republic, and methodological rigor. Peer-reviewed articles, benchmark reports, and official government publications will be prioritized for inclusion.

Data Extraction Strategy: A systematic approach will be employed to extract relevant data from selected studies. This will involve identifying key findings, methodologies used, sample populations, and any significant conclusions related to e-government practices, digitalization, and corruption.

Systematic Review Quality Assessment: The quality of selected studies will be assessed using established criteria for systematic reviews, including clarity of research questions, appropriateness of methodologies, rigor of data analysis, and relevance to the research objectives. This assessment will ensure that only high-quality, reliable studies are included in the review.

2. Conducting the Review

Search Process: A systematic search will be conducted using academic databases such as PubMed, Scopus, and Web of Science, as well as relevant government and organizational websites. Search terms will include variations of "e-government," "digitalization," "corruption," "EU member states," "Slovakia," and "Czech Republic" to capture relevant literature and reports.

Selection of Studies: The selection process will involve screening titles and abstracts for relevance to the research question and applying the inclusion criteria mentioned earlier. Full-text articles and reports meeting the criteria will then be assessed for final inclusion in the review.

Data Extraction and Synthesis: Data extraction will involve systematically retrieving relevant information from selected studies, including key findings, methodologies, and conclusions. Extracted data will be synthesized to identify common themes, trends, and insights related to e-government practices, digitalization impact, and corruption levels within the EU.

3. Reporting the Review

Result Analysis: The analysis will involve synthesizing findings from selected studies to provide a comprehensive overview of e-government practices in the EU, with a focus on Slovakia and the Czech Republic. Key themes such as the impact of digitalization on corruption, clustering of e-government practices, and comparative analysis between countries will be discussed in detail.

Reporting: The findings of the review will be reported following established guidelines for systematic reviews, including a clear presentation of research questions, methodology, results, and conclusions. The report will be structured to facilitate readability and comprehension, ensuring that key insights are effectively communicated to stakeholders, policymakers, researchers, and practitioners in the field of e-government.

Result and Discussion

RQ1: Digitalization Efforts in EU States

The comparison of digitalization efforts in EU states, particularly Slovakia and the Czech Republic, sheds light on the regional dynamics of digital governance and its impact on e-government maturity and service delivery. According to the Digital Economy and Society Index (DESI), both countries have made substantial progress in advancing their digital agendas. However, disparities persist in their e-government maturity levels and service delivery mechanisms. Slovakia, despite making strides in digital infrastructure and connectivity, falls behind the Czech Republic in terms of e-government service sophistication. In contrast, the Czech Republic boasts more streamlined and user-friendly e-government services (Eurostat, 2023).

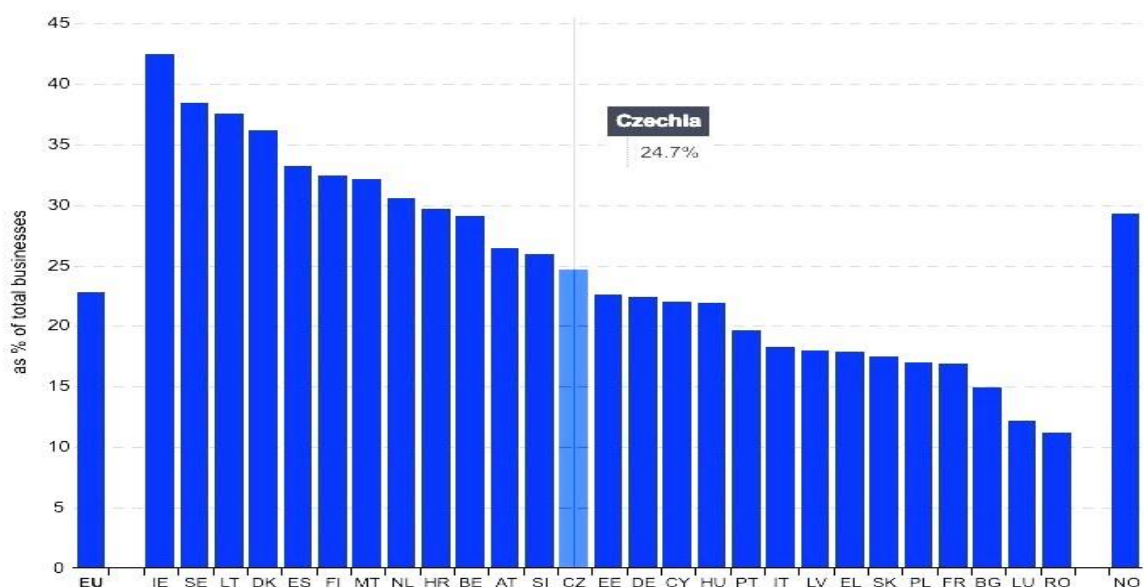


Figure 2: Regional Dynamics of Digital Governance in EU States: A Comparison of Slovakia and the Czech Republic

A Review of E-Government Practices in the Age of Digitalization

These findings of Figure 2 underscore the significance of not only investing in digital infrastructure but also prioritizing the development of user-centric e-government services to enhance citizen engagement and satisfaction (Androniceanu et al., 2020). Furthermore, the discrepancies in e-government maturity between EU member states highlight the necessity for targeted interventions and policy measures to bridge the digital divide and ensure equitable access to digital services across regions (European Commission, 2021).

In the broader context of the European Union, the digital transformation is marked by a growing integration of digital technologies, with over 9 million people employed as ICT specialists, constituting nearly 5% of the EU workforce (Eurostat, 2023). Despite progress, gender disparity persists in ICT roles, with 81% male and 19% female representation. Additionally, the EU still grapples with a digital divide, as 54% of the population possesses basic or above basic digital skill. Online activities are widespread, with almost 90% of EU citizens accessing the internet weekly for various purposes, including online shopping, social networking, and health information. Furthermore, businesses are embracing digitalization, with nearly all EU businesses having broadband internet access and a significant proportion conducting online sales (Eurostat, 2023).

RQ2: Challenges and Successes in Implementing E-Government in Central and Eastern European Nations

The Following table illustrates the obstacles encountered in the adoption of E-government systems in Central and Eastern European countries.

Table 1: Aspects and Challenges in Implementing E-Government in Central and Eastern European Nations

Aspects/Challenges	Description	Citation
Institutional Fragmentation	CEE countries face institutional fragmentation, leading to coordination challenges and hindering seamless service delivery	(Kofi et al.,2017; Špaček et al., 2020)
Bureaucratic Inefficiencies	Bureaucratic red tape and inefficiencies within government agencies slow down the adoption and implementation of e-government initiatives	(Špaček et al., 2020)
Limited Resources	Limited financial and human resources pose significant barriers to the development and maintenance of e-government infrastructure and services	(Ebbbers et al., 2016; Špaček et al., 2020)

Aspects/Challenges	Description	Citation
Digital Literacy Gaps	Disparities in digital literacy levels among citizens hinder their ability to effectively access and utilize e-government services	(Morte-Nadal et al., 200; Fernández-Batanero et al., 2020)
Resistance to Change	Resistance from government officials and citizens to embrace digital transformation impedes the successful implementation of e-government initiatives	(Fernández-Batanero et al., 2020)
Technological Infrastructure	Insufficient technological infrastructure and connectivity in certain regions hinder the deployment of advanced e-government services	(Androniceanu et al., 2022)

Table 1 offers a detailed analysis of the multifaceted landscape of e-government implementation in Central and Eastern European (CEE) nations. It outlines various aspects influencing the adoption and effectiveness of digital governance initiatives, including institutional fragmentation, bureaucratic inefficiencies, and resource constraints (Špaček et al., 2020). These factors contribute to the complexity of e-government implementation in the region, posing significant challenges to seamless service delivery and citizen engagement. Despite these obstacles, success stories such as Estonia's digital-first approach underscore the transformative potential of innovative e-government strategies (Androniceanu et al., 2022).

The table also highlights persistent challenges, such as digital literacy gaps and resistance to change, which hinder the full realization of e-government benefits (Fernández-Batanero et al., 2020). These challenges underscore the need for targeted interventions, including capacity-building initiatives and stakeholder engagement strategies, to address barriers to e-government adoption and promote digital inclusion. Furthermore, the table emphasizes the importance of context-specific approaches tailored to the unique socio-economic and political dynamics of each CEE country, ensuring that e-government initiatives align with local needs and priorities (Androniceanu et al., 2022).

Overall, the table provides valuable insights into the complexities of e-government implementation in Central and Eastern Europe, offering policymakers and practitioners a nuanced understanding of the factors shaping digital governance outcomes in the region. By addressing these challenges and leveraging success stories, CEE nations can unlock the full potential of e-government to enhance governance effectiveness, improve service delivery, and foster citizen empowerment (Špaček et al., 2020).

RQ3: Policymakers' Utilization of Research on E-Government Clusters and Maturity Models

Research on e-government clusters and maturity models provides policymakers with valuable insights for developing strategies to improve digital governance and address issues

A Review of E-Government Practices in the Age of Digitalization

like corruption and the digital divide. By leveraging findings from studies such as Androniceanu et al. (2020), policymakers can identify regional disparities in e-government maturity and tailor interventions to address specific needs and challenges. Additionally, maturity models such as DESI serve as valuable benchmarks for assessing progress and identifying areas for improvement in digital service delivery (Eurostat, 2023).

Furthermore, the integration of e-government clusters into policy frameworks enables policymakers to adopt a holistic approach to digital governance, fostering collaboration and knowledge-sharing among stakeholders (Androniceanu et al., 2022). By promoting data-driven decision-making and evidence-based policy formulation, policymakers can effectively allocate resources and prioritize interventions to maximize the societal impact of e-government initiatives. Moreover, research on e-government maturity and clusters can inform the design and implementation of anti-corruption measures, facilitating transparency and accountability in public administration (European Commission, 2021).

The results and discussion Finally highlight the multifaceted nature of digital governance and the pivotal role of research in informing policy and practice. By addressing the research questions posed, this study contributes to a deeper understanding of regional dynamics, challenges, and opportunities in the realm of e-government, paving the way for evidence-based policymaking and transformative change in digital governance.

Conclusion

In the ever-evolving landscape of digital governance, this comprehensive review has traversed through the intricacies of E-Government practices, shedding light on recent developments and scholarly insights. The convergence of governance and technology stands as a cornerstone in the digital age, redefining efficiency, transparency, and citizen engagement. Through a meticulous exploration, this review has synthesized key contributions, offering a holistic perspective on the state of E-Government practices amidst the relentless tide of digitalization.

The evolution of E-Government, elucidated by seminal works, lays a foundational understanding of the progressive stages governments navigate towards achieving fully functional digital governance. Multifaceted challenges and successes in implementing E-Government, particularly in Central and Eastern European nations, underscore the complexity of digital governance initiatives. Institutional fragmentation, bureaucratic inefficiencies, and limited resources pose significant barriers, while success stories like Estonia's digital-first approach offer glimpses of transformative potential.

Furthermore, global perspectives, such as the United Nations' E-Government Survey, emphasize the transformative role of E-Government in sustainable development, amplifying discussions on its societal impact. Methodological advancements, exemplified by benchmarking studies and case examinations, provide invaluable insights into the user-centric design and delivery of digital public services.

The analysis of digitalization efforts in EU states, alongside challenges and successes in E-Government implementation, offers nuanced insights into regional dynamics and governance paradigms. Disparities in E-Government maturity levels underscore the necessity for targeted interventions and policy measures to bridge the digital divide and ensure equitable access to digital services across regions. Policymakers' utilization of research on E-Government clusters and maturity models holds promise for fostering evidence-based decision-making and transformative change in digital governance.

This review finally contributes substantively to the evolving discourse on E-Government practices, offering insights into regional dynamics, challenges, and opportunities. By synthesizing insights from diverse sources, this study aspires to inform policymaking, foster informed discourse, and guide future research endeavors in the dynamic terrain of digital governance. As we continue to navigate the complexities of digital transformation, the interplay between technology and governance remains pivotal, shaping the future of public administration in the digital age.

Limitations

Despite the comprehensive analysis conducted in this study, there are inherent limitations that should be acknowledged. Firstly, the research primarily focuses on EU member states, specifically Slovakia and the Czech Republic. Consequently, the findings may not be universally applicable to non-EU countries or regions with different socio-political contexts.

Secondly, the study relies on existing data sources, such as reports and surveys, which may have inherent biases or limitations in their methodologies. The accuracy of the results is contingent on the reliability and representativeness of the data provided by these sources.

Thirdly, the dynamic nature of the digital landscape poses a challenge in capturing real-time changes. The study's reliance on historical data may not fully reflect the current state of e-government practices, as developments and advancements continue to unfold.

Recommendations

To address these limitations and enhance the robustness of future research in this domain, several recommendations are proposed. Firstly, researchers should consider expanding the geographical scope to encompass a more diverse range of countries, including non-EU nations, to offer a more comprehensive understanding of global e-government practices.

Secondly, efforts should be made to engage in primary research, including surveys and interviews, to gather firsthand insights from key stakeholders, such as government officials, IT professionals, and citizens. This approach would provide a more nuanced understanding of the challenges and successes in e-government implementation.

Additionally, continuous monitoring and regular updates to data sources are crucial to capture the evolving nature of e-government. Researchers should explore collaborations with relevant government agencies and international organizations to access up-to-date and accurate information. In conclusion, while this study contributes valuable insights into e-government practices, researchers should be cognizant of these limitations and take proactive steps to

address them in future investigations. By doing so, the field of e-government research can advance towards more comprehensive, accurate, and globally relevant findings.

Research Implications

The findings of this study have several important implications for both academic research and practical applications in the field of e-government. These implications contribute to the ongoing discourse surrounding digital governance and offer insights that can shape future research endeavors and policy decisions.

Policy Development and Implementation: The study underscores the significance of tailored e-government policies to enhance digital services in EU member states. Policymakers can leverage the insights gained from this research to refine existing strategies and develop targeted interventions that address specific challenges identified in the digitalization process.

Cross-Country Comparative Analysis: The comparative analysis of Slovakia and the Czech Republic offers a blueprint for similar studies across diverse geographical regions. Researchers can draw inspiration from the methodology employed in this study to conduct comprehensive assessments of e-government practices in other countries, fostering a global understanding of digital governance.

Benchmarking and Best Practices: The identification of e-government clusters and maturity models provides a benchmark for evaluating the effectiveness of digitalization efforts. Policymakers and practitioners can use these models to assess their respective countries' progress and identify best practices, fostering a collaborative environment for knowledge exchange and improvement.

Academic Inquiry and Future Research Directions: Scholars in the field of e-government can build upon the methodologies and frameworks established in this study. Future research may explore additional dimensions of digital governance, delve into the impact of emerging technologies, or investigate the evolving role of e-government in the context of broader societal trends.

Citizen-Centric Approaches: The study emphasizes the importance of ensuring that e-government initiatives remain citizen-centric. Policymakers and practitioners should prioritize user experience and engagement, aligning digital services with the diverse needs and expectations of the public.

International Collaboration and Knowledge Sharing: The international nature of this study highlights the importance of collaboration and knowledge sharing among countries. Policymakers and researchers can use these findings to foster collaborative initiatives, creating platforms for shared learning and cooperation in the ongoing development of e-government practices. In conclusion, the research implications outlined above pave the way for a more nuanced understanding of e-government dynamics, providing guidance for policymakers, researchers, and practitioners to navigate the complex landscape of digital governance effectively.

Declaration of conflicting interest

I, Abdul Wajid Fazil, solemnly declare that there exists no conflict of interest pertaining to the completion and submission of this work. I affirm that my involvement in this research has been carried out with utmost integrity, and I have not been influenced by any personal or financial considerations that could potentially compromise the objectivity, impartiality, or credibility of this scholarly endeavor. I assert that this research has been conducted in adherence to the highest ethical standards, and I am committed to upholding the principles of transparency, honesty, and accountability in the pursuit and dissemination of knowledge.

Acknowledgment

I want to convey my deepest gratitude to Mr. Musawer Hakimi and other colleagues for their invaluable assistance in the completion of this research paper. Their support in writing, data analysis using SPSS, and data collection played a pivotal role in realizing this study. Their expertise and unwavering dedication substantially improved the quality of this work, and I am profoundly appreciative of his contributions. Furthermore, I would like to express my thanks to my family and friends, who have consistently provided unwavering support and encouragement throughout this research journey. Their steadfast belief in my abilities and their comprehension of the demands of this undertaking have remained a perpetual source of motivation and inspiration. It is through the collective efforts of those mentioned above that this paper has come to fruition. Their contributions have added depth and quality to this research.

References

- Androniceanu, A., Georgescu, I., & Kinnunen, J. (2022). Public administration digitalization and corruption in the EU member states. A comparative and correlative research analysis. *Transylvanian Review of Administrative Sciences*, No. 65 E, February, 5-22.
- Androniceanu, A., Kinnunen, J., & Georgescu, I. (2020). E-Government clusters in the EU based on the Gaussian Mixture Models. *Administratie si Management Public*, 35, 6-20. <https://doi.org/10.24818/amp/2020.35-01>
- Belanger F., Carter L. (2009). The impact of the digital divide on e-government use. *Communications of the ACM*, 52(4), 132–135. <https://doi.org/10.1145/1498765.1498801>
- Concha, G., Astudillo, H., Porra, M., & Pimenta, C. (2012). E-Government procurement observatory, maturity model and early measurements. *Government Information Quarterly*, 29, 43–50.
- Damascene J., Andersson. (2019). The public value of e-government- a literature review. *Government Information Quarterly*, 36(2), 167–178. <https://doi.org/10.1016/j.giq.2019.01.001>
- DESI (2021). *Digital Economy and Society Index 2021*. Thematic chapters. Available at: https://media.hotnews.ro/media_server1/document-2021-11-12-25176419-0-raportdesi-2021.pdf

A Review of E-Government Practices in the Age of Digitalization

- DESI Czechia (2021). *Digital Economy and Society Index 2021*. Czechia. Available at: <https://digital-strategy.ec.europa.eu/en/policies/countries-digitisation-performance>
- DESI Slovakia (2021). *Digital Economy and Society Index 2021*. Slovakia. Available at: <https://digital-strategy.ec.europa.eu/en/policies/countries-digitisation-performance>
- Digitization as a tool of e-government in selected public services of the state: international comparison of Slovakia and the Czech Republic *ADMINISTRAȚIE ȘI MANAGEMENT PUBLIC* • 39/2022 131
- Dodel M., Aguirre F. (2018). Digital inequalities' impact on progressive stages of e-government development [Conference session]. Proceedings of the 11th international conference on theory and practice of electronic governance, galway, Ireland (ICEGOV'18), Galway, Ireland, 04 April 2018, ACM. <https://doi.org/10.1145/3209415.3209475>
- Ebbers W.E., Jansen M.G.M., van Deursen A. (2016). Impact of the digital divide on e-government: Expanding from channel choice to channel usage. *Government Information Quarterly*, 33(4), 685–692. <https://doi.org/10.1016/j.giq.2016.08.007>
- European Commission (2021). E-Government action plan. <https://digital-strategy.ec.europa.eu/en/policies/egovernment-action-plan>
- Fath-Allah, A., Cheikhi, L., Al-Qutaish, R. E., & Idri, A. (2014). E-Government Maturity Models: A Comparative Study. *International Journal of Software Engineering and Applications*, 5(3), 71-91. <https://doi.org/10.3233/978-1-61499-670-5-69>
- Fazil, A. W., Hakimi, M., Akbari, R., Quchi, M. M., & Khaliqyar, K. Q. (2023). Comparative Analysis of Machine Learning Models for Data Classification: An In-Depth Exploration. *Journal of Computer Science and Technology Studies*, 5(4), 160-168.
- Fernández-Batanero J.M., Montenegro-Rueda M., Fernández-Cerero J., García-Martínez I. (2020). Digital competences for teacher professional development. Systematic review. *European Journal of Teacher Education*, 40(4), 1–20. <https://doi.org/10.1080/02619768.2020.1827389>
- Hakimi, M., Aslamzai, S., Adhi, N., & Hakimi, S. (2024). DIGITAL TRANSFORMATION OF AFGHANISTAN BANKING: EXPLORING E-BANKING TRENDS AND IMPACTS. *KEUNIS*, 12(1), 90-99. <http://dx.doi.org/10.32497/keunis.v12i1.5286>
- Hakimi, M., Fazil, A. W., Hakimi, F. M., Najieb, K., & Hakimi, S. (2023). Exploring the Influences of Cutting-Edge Technologies on Operational Efficiency, Productivity, and Financial Profitability in Afghanistan's Tourism Sector. *Jurnal Riset Multidisiplin Dan Inovasi Teknologi*, 2(01), 168–83. <https://doi.org/10.59653/jimat.v2i01.417>
- Hwang, M. S., Li, C. T., Shen, J. J., & Chu, Y. P. (2004). Challenges in e-government and security of information. *Information & Security*, 15(1), 9-20.
- Hakimi, M., Mohammad Mustafa Quchi, & Abdul Wajid Fazil. (2024). Human factors in cybersecurity: an in depth analysis of user centric studies. *Jurnal Ilmiah Multidisiplin Indonesia (JIM-ID)*, 3(01), 20–33. <https://doi.org/10.58471/esaprom.v3i01.3832>
- Heeks, R. (2006). *Implementing and Managing eGovernment*. London: Sage.

- Kofi M. I., Vera P., Jianing M. (2017). Predictors of e-government services adoption: A case study of Russian students in China. *International Journal of Management and Fuzzy Systems*, 3(5), 67–74. <https://doi.org/10.11648/j.ijmfs.20170305.12>
- Laposa, T. (2017) The digital transformation of EU-cohesion policy – How to measure the maturity of e-cohesion services (paper prepared for the NISPAcee’s 2017 conference).
- Meyerhoff Nielsen, M. (2017). Citizen use of government eServices: Comparing use, governance and cooperation models in Estonia and Georgia (paper prepared for the NISPAcee’s 2017 conference).
- MIRDI SR (2021). *Národná koncepcia informatizácie verejnej správy*. [National concept of public administration informatization]. Ministry of Investments, Regional Development and Informatization of the Slovak Republic, available at: <https://www.mirri.gov.sk/wp-content/uploads/2021/12/Narodna-koncepciainformatizacie-verejnej-spravy-2021.pdf>
- Morte-Nadal, T., & Esteban-Navarro, M. A. (2022). Digital competences for improving digital inclusion in e-government services: A mixed-methods systematic review protocol. *International Journal of Qualitative Methods*, 21, 16094069211070935. <https://doi.org/10.1177/16094069211070935>
- Niehaves B., Gorbacheva E., Plattfaut R. (2012). The digital divide VS the e-government divide: Do socio-demographic variables (still) impact e-government use among onliners? The 20th European Conference on information systems (ECIS’12). AISSEL. <https://aisel.aisnet.org/ecis2012/199>
- OECD (2019). *Digital Government Index: 2019 results, OECD Public Governance Policy Papers, 03*. OECD Publishing, Paris, <https://dx.doi.org/10.1787/4de9f5bb-en>
- Peristeras, V., Mentzas, G., Tarabanis, K. A., & Abecker, A. (2009). Transforming E-government and E-participation through IT. *IEEE Intelligent Systems*, 24(5), 14-19. <https://doi.org/10.1109/MIS.2009.103>
- Schuppan, T. (2009). E-Government in developing countries: Experiences from sub-Saharan Africa. *Government Information Quarterly*, 26, 118-127. <https://doi.org/10.1016/j.giq.2008.01.006>
- Špaček, D., Csótó, M., and Urs, N. (2020). Questioning the Real Citizen-Centricity of e-Government Development: Digitalization of G2C Services in Selected CEE Countries. *NISPAcee Journal of Public Administration and Policy*, 13(1), 213-243. <https://doi.org/10.2478/nispa-2020-0009>
- Tinholt, D. (2018). *eGovernment Benchmark 2018 – Securing eGovernment for all (Background Report)*. Available at: https://ec.europa.eu/newsroom/dae/document.cfm?doc_id=55487 (accessed 10.05.2022).
- Torres, L., Pina, V., & Acerete, B. (2006). E-Governance developments in european union cities: Reshaping Government’s relationship with citizens. *Governance*, 19(2), 277-302. <https://doi.org/10.1111/j.1468-0491.2006.00315.x>
- Tinholt, D.(2017). *eGovernment Benchmark 2017 - Taking stock of user-centric design and delivery of digital public services in Europe (Final Background Report – Volume 2)*. Available at: <https://op.europa.eu/en/publication-detail/-/publication/7f1b4ecbf9a7-11e7-b8f5-01aa75ed71a1/language-en>.

A Review of E-Government Practices in the Age of Digitalization

- United Nations, Department of Economy and Social Affairs. (2020). *E-Government Survey 2020*. Digital Government in the Decade of Action for Sustainable Development (With addendum on COVID-19 Response). Available at: [https://publicadministration.un.org/egovkb/Portals/egovkb/Documents/un/2020-Survey/2020%20UN%20EGovernment%20Survey%20\(Full%20Report\).pdf](https://publicadministration.un.org/egovkb/Portals/egovkb/Documents/un/2020-Survey/2020%20UN%20EGovernment%20Survey%20(Full%20Report).pdf)
- Van der Linden, N. (2021). *eGovernment Benchmark 2021 – Entering a New Digital Government Era (Background Report)*. Available at: <https://ec.europa.eu/newsroom/dae/redirection/document/80567>.
- World Economic Forum. (2023, September). Digitalization in Europe: A Eurostat Report. Retrieved from <https://www.weforum.org/agenda/2023/09/digitalization-europe-eurostat-report/>