JSIP: Jurnal Studi Ilmu Pemerintahan
Volume 5, No 2, 2024
ISSN: 2722-7405

Exploring Digital Government Trends: A Comprehensive Bibliometric and Systematic Review

Sandi Lubis*[1], Jamaluddin Ahmad[2], Hazel Jovita[3], Hardianti[2], Herman Dema[1]

[1]*Departement of Government Studies, Universitas Muhammadiyah Sidenreng Rappang, Indonesia.*
[2]*Department of Public Administration, Universitas Muhammadiyah Sidenreng Rappang, Indonesia.*
[3]*Department of Political Science, Mindanao State University-Iligan Institute Technology, Philippines.*

*Email Co-Authors: sandi.lubis7@gmail.com

Article Info

Keyword:
Digital Government, Digital Transformation, Artificial Intelligence, Smart Governance, Public Administration.

Abstract: This study presents a comprehensive bibliometric analysis of digital government research from 2014 to 2024, focusing on key trends, dominant subtopics, and implementation challenges. The research identifies a significant increase in publications, particularly during the COVID-19 pandemic, reflecting the heightened relevance of digital transformation in public administration. Key subtopics such as artificial intelligence, digital transformation, and smart governance dominate the field, showcasing the growing integration of advanced technologies in enhancing public services and governance. Despite these advancements, the study highlights persistent challenges, including inadequate technological infrastructure, regulatory lag, data security concerns, and digital inclusion disparities. These issues underscore the need for targeted investments, agile regulatory frameworks, and robust cybersecurity measures to ensure the successful and equitable implementation of digital government initiatives. The findings provide valuable insights for policymakers, practitioners, and researchers, emphasizing the importance of continued exploration of emerging technologies and strategies to overcome barriers to adoption. This study contributes to the existing literature by mapping the evolution of digital government research and offering guidance for future research and policy development in this critical area, aiming to enhance public service delivery and governance in the digital era.

Article History:
Received: 13 May 2024
Revision: 30 June 2024
Accepted: 24 August 2024

DOI: https://doi.org/10.35326/jsip.v5i2.6277

INTRODUCTION

Digital government, or e-government, has emerged as a cornerstone in the transformation of public administration in the current era of information technology (Li & Xu, 2024). Since its inception, digital government has undergone significant evolution, progressing from the mere digitization of administrative processes to the adoption of advanced technologies such as artificial intelligence and big data analytics for more efficient and responsive public services (Pasqualino et al., 2021). Digital government offers numerous advantages, including enhanced operational efficiency, greater transparency (Lawelai, 2023), and broader public participation in decision-making processes (Schwoerer, 2023). However, alongside these advancements, complex challenges have surfaced, including the need for adequate infrastructure, appropriate regulations, data security, and equitable digital inclusion (Chohan & Hu, 2022). The adoption trends of digital technologies by governments vary significantly across different regions of the world, reflecting disparities in resources, policies, and technological

readiness (Xiao et al., 2022). Despite its widely recognized potential, significant challenges persist, hindering optimal implementation. One major issue is the limitation of technological infrastructure, often inadequate to support efficient and reliable digital services (Afzal et al., 2023). Moreover, existing regulations frequently lag behind rapid technological developments, creating legal and policy gaps that impede innovation (Martyniszyn, 2021). Data security remains a critical concern due to increasing cyber threats and the imperative to safeguard sensitive public information. Digital inclusion presents another critical challenge, as the digital divide among various societal groups exacerbates inequality (Martyniszyn, 2021). Furthermore, disparities in digital technology adoption exist both among countries globally and within regions of individual nations, often driven by differences in resources and technological preparedness (Hooks et al., 2022).

Existing research has explored various aspects of digital government, providing valuable insights yet also revealing notable gaps. For instance, (Samsor, 2021) conducted a comprehensive study on the barriers to e-government adoption, identifying critical factors such as organizational inertia and lack of interoperability between systems. Similarly, (Gil-Garcia et al., 2018) highlighted the importance of institutional frameworks in shaping the success of digital government initiatives, arguing that robust governance structures are essential for effective implementation. Meanwhile, studies by (Lindberg et al., 2021) emphasized the role of socio-technical systems, illustrating how the interplay between technology, people, and processes can significantly impact digital government outcomes. Despite these contributions, many studies have been limited by their narrow focus on specific technical aspects or individual policy contexts. For example, studies by (Tamilmani et al., 2021) and (Dwivedi et al., 2019) provided in-depth analyses of user acceptance models in e-government but often overlooked broader global trends and comparative perspectives. Furthermore, the methodological approaches employed in these studies frequently tend toward descriptive narratives, lacking the depth that bibliometric analysis can provide in revealing underlying research patterns and trends (Marikyan et al., 2023).

This research aims to provide a comprehensive bibliometric analysis of the development and challenges in digital government. By analyzing existing literature, this study seeks to identify primary trends and dominant subtopics within the field, as well as elucidate the major challenges encountered in the implementation of digital government. Through a bibliometric approach, this research will evaluate publication patterns, author collaborations, and burgeoning research areas alongside those receiving less attention. Therefore, this study not only serves as a robust foundation for a better understanding of the dynamics of digital government research but also offers guidance for future research endeavors and more effective policy-making. Based on these objectives, the questions in this study are as follows:

1) What are the key trends and developments in digital government research, and how have these trends evolved over the last decade (2014-2024)?
2) Which subtopics dominate the field of digital government, and what are the most influential contributions in these areas?

3) What are the primary challenges associated with the implementation of digital government, as identified in the academic literature, and how do these challenges vary across different regions or contexts?

This research seeks to address these gaps by offering a comprehensive bibliometric analysis and thorough literature review, aiming to make a significant contribution to the existing literature and provide a more holistic perspective on understanding the dynamics of digital government. The novelty of this research lies in its ability to integrate diverse data sources and uncover hidden research patterns, enabling deeper identification of trends and challenges. The justification for this research is particularly strong given the rapid pace of technological advancement and the urgent need for better, more innovative policy adaptation in digital government. By mapping research trends and the challenges faced, this study not only contributes significantly to theory but also offers relevant practical implications for policymakers, practitioners, and academics alike. Thus, this research plays a crucial role in guiding future research efforts and in developing strategies for more effective and responsive policy-making to address the dynamics of digital government in the modern era.

RESEARCH METHOD

This research employs a bibliometric analysis method combined with a systematic literature review (SLR) to identify and analyze trends and challenges in digital government (Rojas-Sánchez et al., 2023). Data collection was conducted through the Scopus scientific database, using keywords such as "digital government," "e-government," and "digital transformation." Articles published in Scopus-indexed journals between 2014 and 2024 were selected based on strict inclusion and exclusion criteria, excluding non-peer-reviewed and irrelevant articles. Bibliometric analysis was performed using software like VOSviewer and Citespace to explore publication data, identify the most productive authors, leading institutions, and countries with the most significant contributions to digital government research, as well as to create visual network maps of author collaborations, keyword analysis, and temporal trend analysis (Prakoso et al., 2023).

The SLR process involved an initial screening of article abstracts and titles, quality assessment using predefined criteria, and data extraction from selected articles based on relevant variables such as research objectives, methodologies, key findings, and recommendations (Afifi et al., 2023). The selection of relevant studies was conducted through extensive literature searches, rigorous screening and evaluation, and further filtering to ensure that only high-quality articles were analyzed. Figure 1 illustrates the methodological framework for this research process.

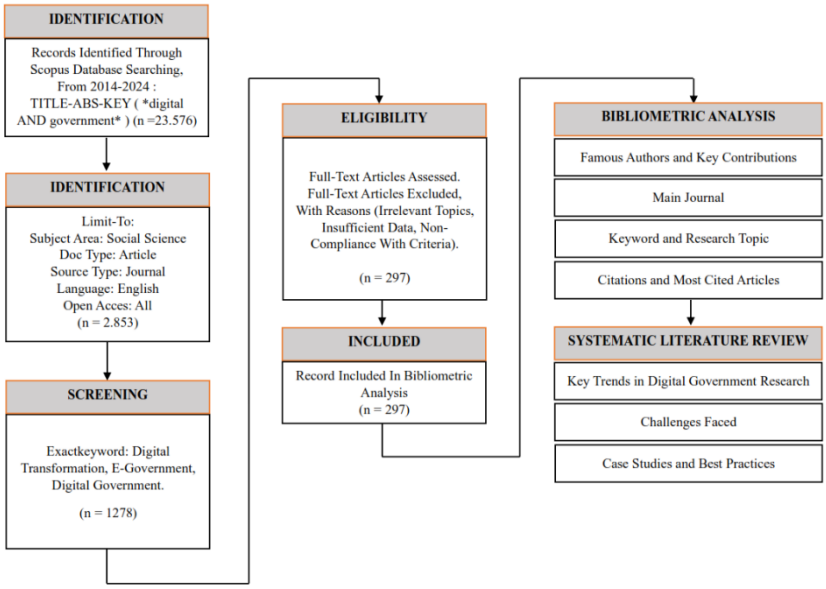

Figure 1. Research Workflow for Bibliometric Analysis with Systematic Literature Review.

RESULTS AND DISCUSSION

Data Description

Digital government has become a significant focus in academic research and government practice due to its potential to enhance efficiency, transparency, and public participation (Mutiarin et al., 2019; Mutiarin & Lawelai, 2023). Despite a substantial increase in the number of publications related to this topic, there remains a limited holistic understanding of the research landscape. Therefore, bibliometric analysis offers a robust method for evaluating publication patterns, identifying influential authors and works, and uncovering dominant research trends and global collaborations. Alongside this, a comprehensive literature review allows for an in-depth exploration of the challenges faced and best practices implemented within the context of digital government. Moreover, the largest selection of peer-reviewed articles can be found in the Scopus database.

The authors used the following keywords to conduct a thorough literature review: TITLE-ABS-KEY (digital AND government). The research was conducted on June 13, 2024, with the final search query as follows: TITLE-ABS-KEY (digital AND government) AND PUBYEAR > 2014 AND PUBYEAR < 2024 AND PUBYEAR > 2014 AND PUBYEAR < 2024 AND (LIMIT-TO (SRCTYPE , "j")) AND (LIMIT-TO (OA , "all")) AND (LIMIT-TO (SUBJAREA , "SOCI")) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (EXACTKEYWORD , "Digital Transformation") OR LIMIT-TO (EXACTKEYWORD , "E-government") OR LIMIT-TO (EXACTKEYWORD , "Digital Government")). The final dataset comprises 297 documents, selected based on the best criteria of being open-access journals only.

Distribution of Publications by Year

The distribution of scientific publications per year serves as a crucial indicator of research activity, trends, and advancements within a given field (García-Villar, 2021). Based on the annual document analysis from the provided graph, a significant upward

trend in the number of published documents is evident. Based on figure 2, The data shows an increase from a single document in 2014 to a peak of 92 documents in 2023, totaling 297 documents in the dataset. From 2014 to 2017, publications increased gradually, reflecting the early stages of research project formation and collaborative networks. A more significant rise in productivity occurred in 2018 and 2019, likely due to the maturation of research initiatives and successful funding efforts. The sharp increase starting in 2020, with 24 documents, 40 in 2021, and 58 in 2022, aligns with the COVID-19 pandemic, which heightened the emphasis on scientific research and publication, particularly in health-related fields. This period saw an unprecedented surge in research activities and collaborations worldwide to address the health crisis, thus increasing the number of published documents.

The peak in 2023, with 92 documents, can be attributed to ongoing research, increased funding and support, increased collaboration, and technological advances. In 2024, a slight decrease to 41 documents could indicate a stabilization of publication rates post-pandemic, as the initial surge in research output declines, as well as the ongoing year. Additionally, the publication process may slow down due to a backlog of documents from previous years or a stricter review process to maintain quality. Overall, the upward trend in document publication underscores the dynamic nature of research activities and evolving priorities within the academic and scientific community. This highlights the importance of continued support for research funding, international collaboration, and dissemination of scientific knowledge through leading journals to maintain and enhance these positive trends.

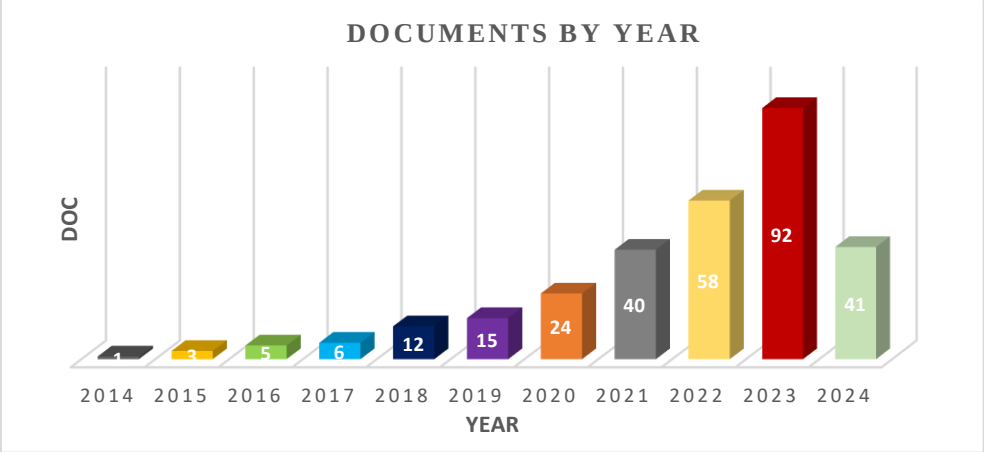

Figure 2. Document by Year of Publication

Distribution By Subject Area

Based on figure 3, The provided pie chart from Scopus illustrates the distribution of documents by subject area, showcasing the prominence of various disciplines in academic publishing. The data reveals that Social Sciences dominate with a substantial 44.5% share, indicating a significant focus and scholarly output in this field. Computer Science follows with 18.9%, underscoring its critical role in modern research and technological advancements. Environmental Science accounts for 11.4%, reflecting growing concerns and research efforts in sustainability and ecological studies. The Energy sector holds 8.4%, highlighting its importance in addressing global energy

challenges. Business, Management, and Accounting make up 4.9%, showing substantial academic interest in organizational studies and economic strategies. Economics, Econometrics, and Finance contribute 3.7%, emphasizing their relevance in understanding financial systems and economic policies. Arts and Humanities, with a 2.4% share, and Decision Sciences and Engineering, each around 2.2%, indicate a balanced yet smaller focus on these areas. Agricultural and Biological Sciences represent 0.4%, while the 'Other' category accounts for 0.9%, capturing miscellaneous and interdisciplinary studies. This distribution underscores the diverse landscape of academic research, reflecting both traditional and emerging fields of study.

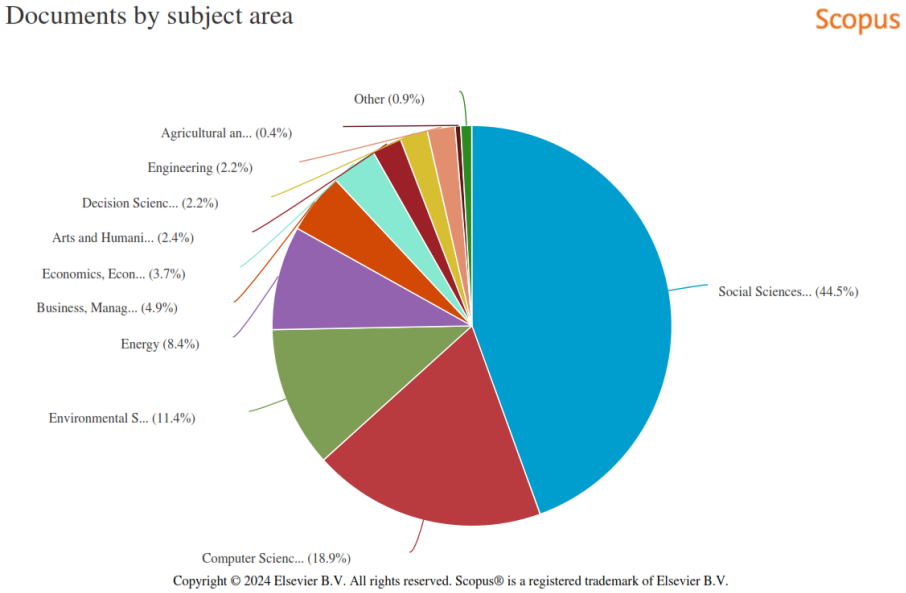

Figure 3. Document by Subject Area

Geographic Distribution

Figure 4 shows an analysis of the distribution of publications in leading international journals revealing a diverse and competitive global research landscape, with the top 15 contributing countries demonstrating substantial academic strength and influence. Leading the list is China with 36 publications, reflecting significant investment in research and development. The United Kingdom follows with 34 publications, supported by strong academic institutions and a strong research culture. The Netherlands, with 20 publications, demonstrates its effective research infrastructure and international collaboration. The United States remains a key player with 18 publications, driven by its extensive research capabilities and funding resources. Spain with 16 publications highlights a strong research environment. Both Germany and Italy contributed 14 publications each, emphasizing their excellence in science and engineering. Russia's 13 publications reflect its historical emphasis on science and technology. Indonesia with 12 publications shows its growing role in the global research community. Austria, South Korea, and Sweden, each with 11 publications, demonstrate strong research institutions and innovation-driven approaches. Australia and Estonia, each with 9 publications, emphasize a strong research ecosystem. Canada, which contributed 8 publications, affirmed its commitment to collaborative scientific efforts. The contributions of these countries illustrate the collaborative and international nature

of contemporary scientific research, driving global progress across a wide range of disciplines (Aksnes & Sivertsen, 2023).

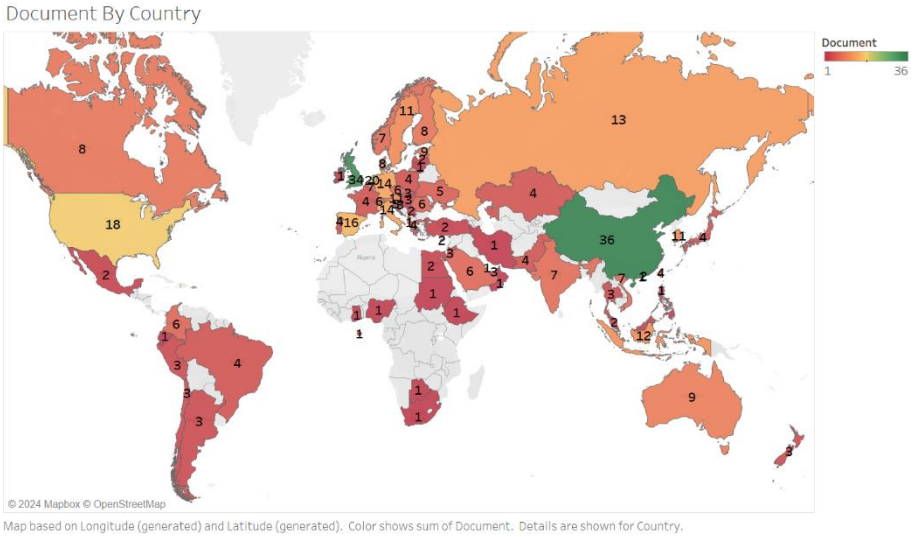

Figure 4. Analysis of publication distribution based on researchers' country of origin

International collaboration mapping of bibliometric data and network visualization reveals a detailed picture of global academic partnerships (Gui et al., 2019). Figure 5 displays the visualization of co-authorship shows a significant pattern in research collaboration, highlighting key countries such as China and the United Kingdom as key centers that play a crucial role in facilitating and leading many collaborative research projects. The Netherlands, Germany, and the United States also emerged as influential nodes in this network, strengthening the flow of scientific knowledge across borders. Regional collaborations form prominent clusters in Europe and Asia-Pacific. In Europe, the UK, the Netherlands, Germany and Sweden demonstrated strong intra-regional collaborations, while in Asia-Pacific, China, India and South Korea demonstrated strong collaborative ties, supporting local scientific efforts and expanding global impact. Some countries, such as Botswana, Malaysia, and Ethiopia, appear to be more isolated, which may be due to limited research capacity or funding constraints. Their integration into the wider network can be enhanced through strategic initiatives such as increased bilateral agreements and participation in international consortiums.

The diversity of connections shared by the UK and China highlights their ability to collaborate with many countries in different regions, enriching their scientific efforts and contributing to the global exchange of knowledge. Meanwhile, countries such as Pakistan and Ethiopia are showing potential to enhance their international collaboration through support and capacity building. Overall, bibliometric data and network visualizations provide important insights into international research collaborations, where central nodes play a major role, regional clusters demonstrate strong partnerships, and isolated and developing countries show potential for further collaborative growth (Lindawati & Meiryani, 2024). These insights help design more effective and inclusive strategies for international collaboration, driving innovation and global scientific progress (Zhan et al., 2022).

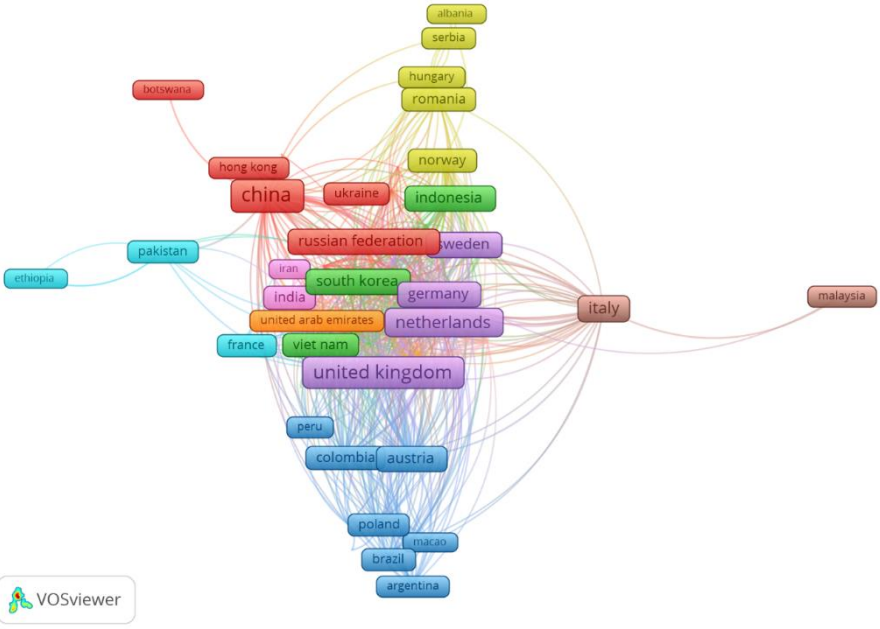

Figure 5. International Collaboration Mapping

Most prolific author

The analysis of scholarly contributions within a specific field is crucial for understanding the evolution of knowledge, identifying leading experts, and mapping the trajectory of future research (Hallinger & Kovačević, 2019). This analysis focuses on the most prolific authors, their major contributions, and the significant research that has shaped contemporary discourse within this domain (Ioannidis, 2023). The findings are derived from a comprehensive review of peer-reviewed articles published in reputable international journals indexed in Scopus. figure 6 highlights the top 15 most productive authors in a specific academic field based on their publication output.

Janssen, M. leads with 7 publications, positioning him as the most prolific contributor. His significant output suggests a central role in advancing the field, with his work likely serving as a foundation for further research. Androniceanu, A. follows closely with 6 publications, indicating a substantial contribution. This close ranking to Janssen suggests that Androniceanu's work is also influential, potentially complementing or expanding upon similar research areas. Authors like Mergel, I., Janowski, T., and Georgescu, I. each have 4 publications, forming a mid-tier group. Their steady contributions suggest they focus on niche areas that support broader research efforts. Similarly, Estevez, E., Dečman, M., and Bharosa, N. with 3 publications each, are notable contributors to emerging trends or specialized topics. Lastly, Guo, Y., Gil-Garcia, J.R., Edelmann, N., Dwivedi, Y.K., Cho, W., Bickerton, S.H., and Berger, J.B. each have 2 publications. These authors represent emerging researchers, potentially at the cutting edge of new methodologies or under-explored areas in the field.

The percentage distribution of publications reflects factors such as experience, access to resources, and the relevance of the research area. Janssen, M., for example, accounts for roughly 14.89% of the total publications among the top 15 authors, underscoring his significant impact on the field.

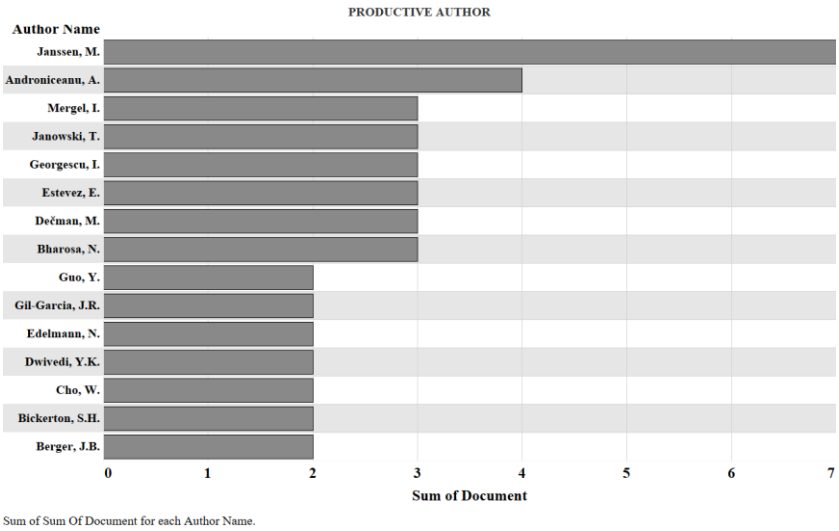

Figure 6. Top 15 Most Productive Authors

Most Cited Articles by Authors

The citation analysis of academic publications provides crucial insights into the impact and influence of research within a specific field (Gerow et al., 2018). Citations are a key metric in evaluating the reach and significance of scholarly work, as they indicate the extent to which an article contributes to ongoing academic discourse (Asaad et al., 2020). This narrative examines the most cited articles in the field, highlighting their contributions, methodological rigor, and the reasons behind their widespread recognition (Baumeister & Vohs, 2003). Figure 7 represents a co-citation network of scholarly works related to Digital Government, visualized using VOSviewer.

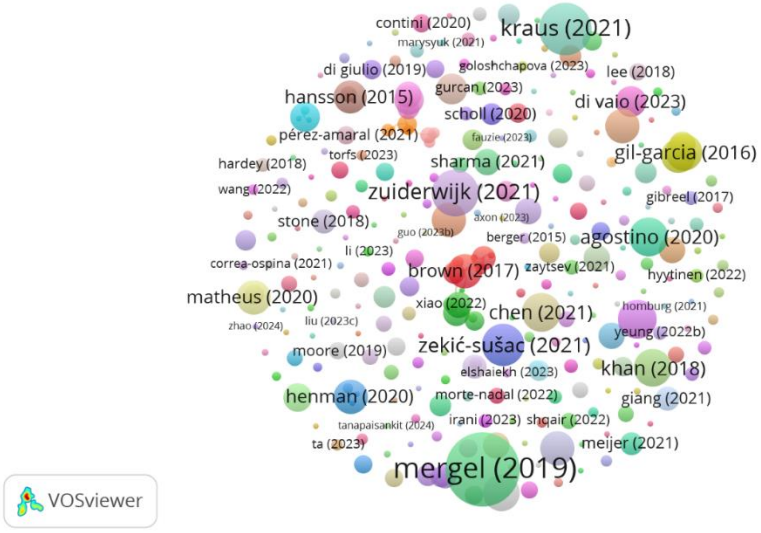

Figure 7. Co-Citation Network Visualization

Table 1 lists the top 10 most cited academic documents related to digital transformation and smart governance, showcasing their significance in shaping the field. Leading the list is the work by (Mergel et al., 2019) with 620 citations, focusing on defining digital transformation through expert interviews. Other notable works include (Kraus et al., 2021) with 261 citations, providing a comprehensive overview of digital

transformation research, and (Zuiderwijk et al., 2021) with 191 citations, examining the implications of artificial intelligence in public governance. These documents have played pivotal roles in advancing the understanding and implementation of digital transformation, particularly in the context of public governance and smart cities. The table also highlights the influential nature of interdisciplinary research, particularly in areas like AI, blockchain, and machine learning, which are increasingly relevant to public sector efficiency and service delivery.

Table 1. Top 10 Most Cited Documents

No	Document	Cite	Links	c
1	(Mergel et al., 2019)	620	0	**Title:** Defining digital transformation: Results from expert interviews, **Findings:** This research contributes to a deeper understanding of how public sector entities are navigating digital transformation, providing a structured approach to the reasons behind it, the methods employed, and the goals they aim to achieve, such as increased transparency, interoperability, and citizen satisfaction.
2	(Kraus et al., 2021)	261	0	**Title:** Digital Transformation: An Overview of the Current State of the Art of Research, **Findings:** The study identifies several research gaps within the existing literature and proposes future research directions that could help both government and private sectors better adapt to the disruptive changes associated with digital transformation.
3	(Zuiderwijk et al., 2021)	191		**Title:** Implications of the use of artificial intelligence in public governance: A systematic literature review and a research agenda **Findings:** To advance the field, the authors propose a research agenda with two main components: process-related and content-related recommendations. Process-wise, they suggest that future research should be more public sector-focused, empirical, multidisciplinary, and specific to particular forms of AI rather than AI in general.
4	(Zekić-Sušac et al., 2021)	151	0	**Title:** Machine learning based system for managing energy efficiency of public sector as an approach towards smart cities **Findings:** The study explores the integration of Big Data platforms and machine learning techniques to create an intelligent system for managing energy efficiency in public sector buildings.
5	(Agostino et al., 2020)	124	0	**Title:** s an accelerator of digital transformation in public service delivery **Findings:** The study demonstrates that digital technologies can effectively expand audience reach and create new interaction methods, showcasing the potential benefits of online service delivery.
6	(Rowe, 2020)	123	0	**Title:** Contact tracing apps and values dilemmas: A privacy paradox in a neo-liberal world **Findings:** The research suggests that contact tracing apps could become a symbol of digital transformation and shifting values in the western world, raising important questions about privacy, security, and the role of technology in society.
7	(Chen et al., 2021)	117	0	**Title:** Role of government to enhance digital transformation in small service business
8	(Khan et al., 2018)	109	0	**Title:** Secure digital voting system based on blockchain technology **Findings:** The study showcases how blockchain technology can address existing vulnerabilities in e-voting systems, paving the way for more secure and trustworthy electronic voting mechanisms.
9	(Gil-Garcia & Sayogo, 2016)	104	3	**Title:** Government inter-organizational information sharing initiatives: Understanding the main determinants of success **Findings:** The findings underscore the importance of technical compatibility and structured management in facilitating effective inter-organizational collaboration, providing valuable insights for enhancing governance structures to address complex sociotechnical challenges.

10	(Xue et al., 2022)	101	2	**Title:** Can Digital Transformation Promote Green Technology Innovation? **Findings:** The study highlights the importance of government intervention in regulating market order and creating supportive financial policies. Such measures can encourage enterprises to engage in digital transformation, thereby enhancing their capacity for green technology innovation and contributing to broader environmental sustainability goals in China.

The research results offer a comprehensive overview of the trends, subtopics, and challenges associated with digital government research from 2014 to 2024. This discussion section synthesizes the findings, comparing them with existing literature and contextualizing the results within broader theoretical and practical frameworks.

Key Trends and Developments in Digital Government Research

The analysis reveals a marked increase in digital government research over the past decade, with a significant surge in publications observed around the onset of the COVID-19 pandemic. This finding aligns with existing literature, which highlights how the pandemic accelerated digital transformation across various sectors, including public administration (Agostino et al., 2020). The sharp rise in research activity during this period underscores the urgency of developing digital solutions in response to the global health crisis, reflecting a broader trend toward digitization in government operations.

Previous studies have documented the evolution of digital government from its initial focus on e-government, characterized by the digitization of administrative processes, to more sophisticated implementations involving artificial intelligence (AI), big data, and blockchain technologies (Mergel et al., 2019). The research findings confirm this trajectory, indicating a shift in scholarly focus toward advanced technologies that enhance efficiency and responsiveness in public services. This progression is consistent with the concept of digital transformation as a multi-stage process, wherein governments move from basic online services to more integrated and intelligent systems (Liu et al., 2021).

Dominant Subtopics in Digital Government Research

The bibliometric analysis identifies several dominant subtopics within the field, including AI, digital transformation, and smart governance. These areas have garnered significant attention due to their potential to revolutionize public sector operations (Nurmandi & Kim, 2015; Sulistyaningsih et al., 2021). For instance, the high citation count of studies focusing on AI in public governance (Zuiderwijk et al., 2021) suggests that scholars and practitioners alike recognize the transformative power of AI in enhancing decision-making processes, optimizing resource allocation, and improving service delivery. Moreover, the prominence of smart governance as a research subtopic reflects an increasing interest in how digital technologies can be leveraged to create more transparent, participatory, and efficient governance structures (Chen et al., 2021).

This aligns with the broader trend in public administration research that advocates for the integration of technology into governance frameworks to meet the demands of modern, digitally-savvy citizens (Mergel et al., 2019). The significant contribution of studies on digital voting systems, particularly those based on blockchain technology (Khan et al., 2018), highlights the growing concern with ensuring the security and

integrity of electoral processes in the digital age. This concern is consistent with the increasing emphasis on cybersecurity and data protection in the implementation of digital government initiatives (Xue et al., 2022).

Challenges in Implementing Digital Government

The research results also shed light on the persistent challenges that hinder the effective implementation of digital government. The limitations of technological infrastructure, particularly in less developed regions, are a recurring theme in the literature (Hooks et al., 2022). This issue is compounded by the digital divide, which exacerbates social inequalities by restricting access to digital services for marginalized communities (Martyniszyn, 2021). The findings underscore the need for targeted investments in infrastructure and digital literacy programs to bridge this gap and promote inclusive digital government. Another significant challenge identified in the study is the lag in regulatory frameworks that often fail to keep pace with rapid technological advancements (Martyniszyn, 2021).

This regulatory lag creates uncertainties and legal barriers that can stymie innovation and hinder the adoption of digital government solutions. The research corroborates earlier studies that advocate for agile regulatory approaches that can adapt to the evolving digital landscape (Tamilmani et al., 2021). Data security remains a critical concern, particularly in the context of increasing cyber threats and the need to protect sensitive public information . The study's findings highlight the importance of robust cybersecurity measures and governance structures that can ensure the safe and ethical use of digital technologies in government (Gil-Garcia & Sayogo, 2016).

Implications and Future Research Directions

The results of this research have several implications for both theory and practice. The identification of key trends and subtopics provides a roadmap for future research, suggesting that scholars should continue to explore the integration of emerging technologies such as AI and blockchain into public governance. Additionally, the challenges highlighted in the study point to the need for further investigation into strategies for overcoming barriers to digital government implementation, particularly in resource-constrained settings. For policymakers, the findings emphasize the importance of developing comprehensive digital strategies that address infrastructure, regulatory, and security challenges.

By fostering international collaboration and investing in digital literacy and infrastructure, governments can better harness the potential of digital technologies to improve public services and governance. In conclusion, this discussion has contextualized the research findings within existing literature and broader theoretical frameworks, offering insights into the evolving landscape of digital government research. The study not only contributes to our understanding of the current state of the field but also provides a foundation for future research and policy development in this critical area.

CONCLUSIONS

This study provides a comprehensive analysis of the evolving landscape of digital government research from 2014 to 2024, highlighting key trends, dominant subtopics, and persistent challenges. The research findings reveal a significant growth in digital government publications, particularly following the onset of the COVID-19 pandemic, underscoring the increasing importance of digital transformation in public administration. The analysis identifies artificial intelligence, digital transformation, and smart governance as the dominant subtopics within the field, reflecting the scholarly focus on integrating advanced technologies into government operations to enhance efficiency, transparency, and public participation. Despite the promising advancements in digital government, several challenges remain. The study highlights the ongoing issues related to inadequate technological infrastructure, regulatory lag, data security, and digital inclusion. These challenges underscore the need for targeted investments, agile regulatory frameworks, and robust cybersecurity measures to ensure the successful implementation of digital government initiatives. Additionally, addressing the digital divide is crucial to promoting equitable access to digital services and preventing further social inequalities.

The implications of this research extend beyond academic discourse, offering valuable insights for policymakers and practitioners. By understanding the trends and challenges identified in this study, stakeholders can better navigate the complexities of digital government implementation, ensuring that digital transformation efforts are both effective and inclusive. Future research should continue to explore the integration of emerging technologies and develop strategies to overcome the barriers to digital government adoption, particularly in resource-limited contexts. In conclusion, this study contributes to the growing body of literature on digital government by providing a detailed bibliometric analysis and identifying critical areas for future research and policy development. As governments worldwide continue to embrace digital transformation, addressing the identified challenges will be essential to realizing the full potential of digital government in enhancing public service delivery and governance in the modern era.

ACKNOWLEDGEMENT

I would like to express my sincere gratitude to Jamaluddin Ahmad, Herman Demak and Hazel Jovita for their invaluable support and contributions to this work. Their guidance, insights, and encouragement have been instrumental in the completion of this research. Thank you for your dedication and assistance throughout this process.

REFERENCE

Afifi, M., Stryhn, H., & Sanchez, J. (2023). Data extraction and comparison for complex systematic reviews: a step-by-step guideline and an implementation example using open-source software. *Systematic Reviews*, *12*(1), 1–14. https://doi.org/10.1186/s13643-023-02322-1

Afzal, A., Khan, S., Daud, S., Ahmad, Z., & Butt, A. (2023). Addressing the Digital Divide:

Access and Use of Technology in Education. *Journal of Social Sciences Review*, *3*(2), 883–895. https://doi.org/10.54183/jssr.v3i2.326

Agostino, D., Arnaboldi, M., & Lema, M. D. (2020). New development: COVID-19 as an accelerator of digital transformation in public service delivery. *Public Money and Management*, 1–4. https://doi.org/10.1080/09540962.2020.1764206

Aksnes, D. W., & Sivertsen, G. (2023). Global trends in international research collaboration, 1980-2021. *Journal of Data and Information Science*, *8*(2), 26–42. https://doi.org/10.2478/jdis-2023-0015

Asaad, M., Howell, S. M., Rajesh, A., Meaike, J., & Tran, N. V. (2020). Altmetrics in plastic surgery journals: Does it correlate with citation count? *Aesthetic Surgery Journal*, *40*(11), NP628–NP635. https://doi.org/10.1093/asj/sjaa158

Baumeister, R. F., & Vohs, K. D. (2003). NOMINATING ARTICLES: Social Psychology Articles From the 1980s and 1990s: Some New Classics and Overlooked Gems . *Psychological Inquiry*, *14*(3–4), 193–195. https://doi.org/10.1080/1047840X.2003.9682878

Chen, C. L., Lin, Y. C., Chen, W. H., Chao, C. F., & Pandia, H. (2021). Role of government to enhance digital transformation in small service business. *Sustainability (Switzerland)*, *13*(3), 1–26. https://doi.org/10.3390/su13031028

Chohan, S. R., & Hu, G. (2022). Strengthening digital inclusion through e-government: cohesive ICT training programs to intensify digital competency. *Information Technology for Development*, *28*(1), 1–23. https://doi.org/10.1080/02681102.2020.1841713

Dwivedi, Y. K., Rana, N. P., Jeyaraj, A., Clement, M., & Williams, M. D. (2019). Re-examining the Unified Theory of Acceptance and Use of Technology (UTAUT): Towards a Revised Theoretical Model. *Information Systems Frontiers*, *21*(3), 719–734. https://doi.org/10.1007/s10796-017-9774-y

García-Villar, C. (2021). A critical review on altmetrics: can we measure the social impact factor? *Insights into Imaging*, *12*(1). https://doi.org/10.1186/s13244-021-01033-2

Gerow, A., Hu, Y., Boyd-Graber, J., Blei, D. M., & Evans, J. A. (2018). Measuring discursive influence across scholarship. *Proceedings of the National Academy of Sciences of the United States of America*, *115*(13), 3308–3313. https://doi.org/10.1073/pnas.1719792115

Gil-Garcia, J. R., Dawes, S. S., & Pardo, T. A. (2018). Digital government and public management research: finding the crossroads. *Public Management Review*, *20*(5), 633–646. https://doi.org/10.1080/14719037.2017.1327181

Gil-Garcia, J. R., & Sayogo, D. S. (2016). Government inter-organizational information sharing initiatives: Understanding the main determinants of success. *Government Information Quarterly*, *33*(3), 572–582. https://doi.org/10.1016/j.giq.2016.01.006

Gui, Q., Liu, C., & Du, D. (2019). Globalization of science and international scientific collaboration: A network perspective. *Geoforum*, *105*, 1–12. https://doi.org/https://doi.org/10.1016/j.geoforum.2019.06.017

Hallinger, P., & Kovačević, J. (2019). A Bibliometric Review of Research on Educational Administration: Science Mapping the Literature, 1960 to 2018. *Review of Educational Research*, *89*(3), 335–369. https://doi.org/10.3102/0034654319830380

Hooks, D., Davis, Z., Agrawal, V., & Li, Z. (2022). Exploring factors influencing technology adoption rate at the macro level: A predictive model. *Technology in Society*, *68*.

https://doi.org/10.1016/j.techsoc.2021.101826

Ioannidis, J. P. A. (2023). Prolific non-research authors in high impact scientific journals: meta-research study. *Scientometrics*, *128*(5), 3171–3184. https://doi.org/10.1007/s11192-023-04687-5

Khan, K. M., Arshad, J., & Khan, M. M. (2018). Secure digital voting system based on blockchain technology. *International Journal of Electronic Government Research*, *14*(1), 53–62. https://doi.org/10.4018/IJEGR.2018010103

Kraus, S., Jones, P., Kailer, N., Weinmann, A., Chaparro-Banegas, N., & Roig-Tierno, N. (2021). Digital Transformation: An Overview of the Current State of the Art of Research. *SAGE Open*, *11*(3), 21582440211047576. https://doi.org/10.1177/21582440211047576

Lawelai, H. (2023). Understanding Digital Governance in Smart Cities: In-Depth Study Utilizing VOSviewer and CiteSpace. *E3S Web of Conferences*, *440*. https://doi.org/10.1051/e3sconf/202344007003

Li, H., & Xu, J. (2024). Impact of Digital Government on Digital Transformation of Enterprises from the Perspective of Urban Economic Sustainable Development. *Sustainability (Switzerland)* , *16*(7). https://doi.org/10.3390/su16072667

Lindawati, A. S. L., & Meiryani. (2024). A bibliometric analysis on the research trends of global climate change and future directions. *Cogent Business and Management*, *11*(1). https://doi.org/10.1080/23311975.2024.2325112

Lindberg, J., Bhatt, R., & Ferm, A. (2021). Older people and rural eHealth: perceptions of caring relations and their effects on engagement in digital primary health care. *Scandinavian Journal of Caring Sciences*, *35*(4), 1322–1331. https://doi.org/10.1111/scs.12953

Liu, Q., Zhao, Y., Kamioka, T., & Nakamura, M. (2021). Digital Transformation Challenges in the Sales of Pharmaceutical Companies in Japan. *Asian Journal of Business Research*, *11*(3), 72–91. https://doi.org/10.14707/ajbr.210115

Marikyan, D., Papagiannidis, S., & Stewart, G. (2023). Technology acceptance research : Meta-analysis. *Journal of Information Science*. https://doi.org/10.1177/01655515231191177

Martyniszyn, M. (2021). Competitive Harm Crossing Borders: Regulatory Gaps And A Way Forward. *Journal of Competition Law & Economics*, *17*(3), 686–707. https://doi.org/10.1093/joclec/nhaa034

Mergel, I., Edelmann, N., & Haug, N. (2019). Defining digital transformation: Results from expert interviews. *Government Information Quarterly*, *36*(4), 101385. https://doi.org/10.1016/j.giq.2019.06.002

Mutiarin, D., & Lawelai, H. (2023). Optimizing the Role of ICT and Citizen Participation: Analysis of Smart City Governance Implementation in Jakarta, Indonesia and Kuala Lumpur, Malaysia. *E3S Web of Conferences*, *440*, 03027. https://doi.org/10.1051/e3sconf/202344003027

Mutiarin, D., Nurmandi, A., Jovita, H., Fajar, M., & Lien, Y. N. (2019). How do government regulations and policies respond to the growing online-enabled transportation service (OETS) in Indonesia, the Philippines, and Taiwan? *Digital Policy, Regulation and Governance* , *21*(4), 419–437. https://doi.org/10.1108/DPRG-01-2019-0001

Nurmandi, A., & Kim, S. (2015). Making e-procurement work in a decentralized procurement system: A comparison of three Indonesian cities. *International Journal of Public Sector Management*, *28*(3), 198–220. https://doi.org/10.1108/IJPSM-03-2015-0035

Pasqualino, R., Demartini, M., & Bagheri, F. (2021). Digital transformation and sustainable oriented innovation: A system transition model for socio-economic scenario analysis. *Sustainability (Switzerland)*, *13*(21). https://doi.org/10.3390/su132111564

Prakoso, V., Lawelai, H., Nurmandi, A., Purnomo, E. P., & Jovita, H. (2023). Research Trends, Topics, and Insights on Network Security and the Internet of Things in Smart Cities. *Jurnal Studi Ilmu Pemerintahan*, *4*(2), 191–206. https://doi.org/10.35326/jsip.v4i2.4707

Rojas-Sánchez, M. A., Palos-Sánchez, P. R., & Folgado-Fernández, J. A. (2023). Systematic literature review and bibliometric analysis on virtual reality and education. In *Education and Information Technologies* (Vol. 28, Issue 1). Springer US. https://doi.org/10.1007/s10639-022-11167-5

Rowe, F. (2020). Contact tracing apps and values dilemmas: A privacy paradox in a neo-liberal world. *International Journal of Information Management*, *55*. https://doi.org/10.1016/j.ijinfomgt.2020.102178

Samsor, A. M. (2021). Challenges and Prospects of e-Government implementation in Afghanistan. *International Trade, Politics and Development*, *5*(1), 51–70. https://doi.org/10.1108/ITPD-01-2020-0001

Schwoerer, K. (2023). An exploratory study of social media's role in facilitating public participation in e-rulemaking using computational text analysis tools. *Policy and Internet*, *15*(2), 178–203. https://doi.org/10.1002/poi3.332

Sulistyaningsih, T., Nurmandi, A., Salahudin, S., Roziqin, A., Kamil, M., Sihidi, I. T., Romadhan, A. A., & Loilatu, M. J. (2021). Public policy analysis on watershed governance in Indonesia. *Sustainability (Switzerland)*, *13*(12). https://doi.org/10.3390/su13126615

Tamilmani, K., Rana, N. P., & Dwivedi, Y. K. (2021). Consumer Acceptance and Use of Information Technology: A Meta-Analytic Evaluation of UTAUT2. *Information Systems Frontiers*, *23*(4), 987–1005. https://doi.org/10.1007/s10796-020-10007-6

Xiao, J., Han, L., & Zhang, H. (2022). Exploring Driving Factors of Digital Transformation among Local Governments: Foundations for Smart City Construction in China. *Sustainability (Switzerland)*, *14*(22). https://doi.org/10.3390/su142214980

Xue, L., Zhang, Q., Zhang, X., & Li, C. (2022). Can Digital Transformation Promote Green Technology Innovation? *Sustainability (Switzerland)*, *14*(12). https://doi.org/10.3390/su14127497

Zekić-Sušac, M., Mitrović, S., & Has, A. (2021). Machine learning based system for managing energy efficiency of public sector as an approach towards smart cities. *International Journal of Information Management*, *58*. https://doi.org/10.1016/j.ijinfomgt.2020.102074

Zhan, Z., Shen, W., Xu, Z., Niu, S., & You, G. (2022). A bibliometric analysis of the global landscape on STEM education (2004-2021): towards global distribution, subject integration, and research trends. *Asia Pacific Journal of Innovation and Entrepreneurship*, *16*(2), 171–203. https://doi.org/10.1108/apjie-08-2022-0090

Zuiderwijk, A., Chen, Y.-C., & Salem, F. (2021). Implications of the use of artificial intelligence in public governance: A systematic literature review and a research agenda. *Government Information Quarterly*, *38*(3). https://doi.org/10.1016/j.giq.2021.101577