

Digital Transformation in Governance: Implications for Public Policy Effectiveness

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Abstract: Digital governance has become an important area of research as governments increasingly adopt digital technologies to transform public administration and governance practices. This study aims to map the development, dominant themes, and emerging research directions of digital governance research in Indonesia. The study employs a bibliometric analysis of publications indexed in the Scopus database. Literature selection followed the PRISMA framework, while bibliographic data were analyzed using VOSviewer through keyword co-occurrence, network, overlay, and density visualizations. The analysis covers 116 publications included in the final dataset. The findings indicate an increasing scholarly interest in digital governance in Indonesia, with digital transformation, e-government, public administration, public policy, data governance, and decision-making emerging as central themes. The keyword mapping also identifies growing attention to citizen engagement, cybersecurity, and local government. These findings indicate a broader development of digital governance research from technology-oriented e-government toward institutional, policy, data, and citizen-oriented governance perspectives. The identified emerging and less-developed themes provide opportunities for future research, particularly concerning local implementation, administrative capacity, digital security, and citizen engagement.

1. Introduction

Effective digital transformation plans are difficult to implement in the public sector because they must account for different government contexts, as well as organizational, cultural, and technological factors. To increase efficiency, openness, and citizen participation in delivering government services, the public sector must undergo a digital transition (Bravo Rojas et al., 2024). By leveraging cutting-edge technology to strengthen governance, efficiency, and public confidence, digital accountability transforms transparency and public service delivery. Innovations like blockchain, artificial intelligence, and real-time data analytics are revolutionizing financial reporting, fraud prevention, and decision-making processes (Tariq, 2025). One dynamic component of governance resilience is the digital transformation of government services. Every aspect of government has incorporated technological advancements, transforming it into a forum for communication with organizations, businesses, communities, and citizens. In addition to helping residents, it also increases participation and trust in state-run organizations (Hernandez et al., 2023).

Amorphous public administration represents another paradigm change that is gradually coming into focus. This is e-Government, or governance aided by ICT. The term "e-Government" refers to the symbiotic

relationship between the adoption of ICT and a new management approach. The term "e-Government" describes innovative approaches and practices in all facets of the public administration system (Islam & Ehsan, 2015). Current governance and public administration have been impacted by information and communication technology, or ICT. On the one hand, electronic government, or e-government, services were created to streamline government processes and enhance citizen-government communication; on the other hand, new governance models were established to empower citizens and include them in the decision-making process while enhancing transparency (Ibrahim et al., 2015). For aging populations worldwide, the widening digital divide—which denies older persons access to e-government services—has become a pressing concern. Although many current initiatives focus on making certain technologies more senior-friendly, they often overlook more significant issues such as securing user privacy, coordinating across domains, and dynamically adjusting services (Chen et al., 2025).

For academics and policymakers in administration and public policy, the spread of new technologies in the digital sphere poses serious challenges. The decentralization of the digital world and rapid technological advancements create a "speed problem" between current legal frameworks and the rapidly evolving technical landscape (Uzun, 2023). Digital transformation requires collaboration among stakeholders, including government agencies, non-governmental organizations, and the community. Effective teamwork and facilitative leadership are key to the success of digital projects like the West Java Digital Service (JDS), which strengthens the legitimacy and effectiveness of public policy (Maulana et al., 2024). Administrative performance in public sector enterprises has been demonstrated to improve with the adoption of e-SAKIP (Electronic Government Agency Performance Accountability System). Overcoming obstacles to change, communicating benefits effectively, and reaching digital maturity are all essential components of a successful digital transition (Danar, 2024).

Data collection, digitization, digitalization, and digital transformation are the four steps that usually comprise the transformation process. Since its implementation in 2016, this organized strategy has led to higher investment and more effective business processes. Data-driven decision-making backed by technology is a result of digital transformation, which also presents opportunities and obstacles to its advancement (Amir et al., 2020). To promote and control the digital creative economy, the Indonesian government employs sophisticated governance procedures. To help civil servants navigate the digital era of the creative industry successfully, flexible strategies and regulations are needed, highlighting the need for digital innovation co-creation programs (Dellyana et al., 2023). Digital transformation is a key driver of improved functionality and security in public institutions' technological infrastructure. In what ways do government organizations benefit from the use of blockchain, cloud computing, and artificial intelligence (AI) in terms of enhanced decision-making, operational effectiveness, and strong cybersecurity (Saragih, 2025).

This study aims to analyze how digital transformation in governance enhances public policy effectiveness in Indonesia. This study specifically seeks to determine how digital transformation is implemented in the governance process, analyze how digitization promotes accountability, transparency, and public participation, and assess its effects on the effectiveness and quality of public policy implementation. By identifying patterns and tactics for digital-based governance, public institutions will be better equipped to create and carry out responsive, adaptable, and public service-oriented policies.

The benefits of this research are divided into two aspects, namely theoretical and practical. Theoretically, this research is expected to enrich the study of government science and public policy, particularly in understanding the relationship between digital transformation and the effectiveness of governance in the modern era. This research also contributes to governance theory and digital public policy by offering a new perspective on technology's role in strengthening transparency, accountability, and public participation. In practical terms, the results are expected to serve as a reference for

policymakers at both the central and regional levels in designing more focused and sustainable digital transformation strategies. The community may use this research as a foundation to comprehend the significance of active involvement in technology-based government, and state authorities can use it to improve their digital competency and capacity.

Previous studies have examined digital governance in Indonesia from different perspectives, but their analytical scopes remain fragmented. focused on e-government and the perceived benefits of e-filing, emphasizing technology-based public services rather than the broader structure of digital governance research. Examined collaborative approaches to digital government transformation through expert interviews, highlighting organizational collaboration and facilitative leadership (Sari et al., 2021). Meanwhile, discussed the opportunities and challenges of digital technologies in public administration, but did not systematically map the relationships among the major research themes. Examined digital transformation strategies in governmental environments, with emphasis on organizational and institutional dimensions (Lutsenko, 2024). These studies provide important insights, but they do not systematically identify how digital governance research in Indonesia has developed, which concepts are most strongly interconnected, and which themes are emerging or underexplored. Therefore, this study addresses the gap through bibliometric analysis of Scopus-indexed publications, focusing on publication trends, institutional and author contributions, keyword relationships, dominant themes, emerging topics, and research gaps (Sholeh et al., 2025).

2. Literature Review

Digital Transformation and the Evolution of E-government

Previous research indicates that digital transformation in the public sector has evolved from adopting electronic government systems to broader organizational and governance changes. For example, one study examined e-government through the perceived benefits of e-filing in Indonesia, focusing primarily on technology-based service delivery (Yulianto et al., 2026). In contrast, one study examined digital government transformation through expert interviews and emphasized collaboration and facilitative leadership as organizational dimensions of transformation. These studies demonstrate that digitalization is examined not only from a technological perspective but also through organizational and institutional factors (Valero Torrijos & Cerdá Meseguer, 2020). Recent literature further expands this discussion by connecting digital transformation with administrative capacity, data governance, cybersecurity, and organizational adaptation. Examined digital transformation strategies in governmental environments, focusing specifically on the transformation of Indonesian administration and bureaucratic systems (Virnandes et al., 2024). Emphasized the relationship between digital transformation and technological infrastructure, particularly performance and security. Taken together, these studies suggest a movement from technology-centered e-government research toward broader questions concerning organizational and institutional transformation (Saragih, 2025).

Digital Governance and Public Administration

The expansion of digital technologies has also changed the conceptual scope of research on public administration. Earlier e-government studies emphasized using ICT to streamline administrative processes and facilitate government–citizen communication. More recent studies discuss digital governance in relation to collaboration, accountability, participation, data management, and institutional coordination (Pauluzzo et al., 2024). For instance, some demonstrate the relevance of collaborative approaches to digital government transformation, whereas research on digital accountability and e-participation highlights the importance of citizen involvement and institutional responsiveness. These studies differ in

their research approaches and analytical emphases (Verhoest et al., 2024). Some investigate specific digital services or technologies, while others examine organizational processes and governance relationships. This diversity demonstrates the expanding scope of digital governance research, but it also produces a fragmented literature in which technological, organizational, and governance dimensions are often examined separately. The bibliometric approach adopted in this study addresses this fragmentation by examining how these concepts connect across the literature (Gunawan et al., 2025).

Digital Governance, Data, and Policy Process

Another important development concerns the growing connection between digital governance and public policy. Digital transformation has increasingly been discussed in relation to data-driven decision-making, policy implementation, monitoring, and evaluation. Discussing digital transformation in relation to new opportunities created by digital technologies highlights the role of digital technologies in institutional performance and security (Eren & Duman, 2025). These studies indicate that data and digital infrastructure have become increasingly relevant to contemporary policy processes. However, previous studies do not necessarily examine these dimensions within a single analytical framework (Yar et al., 2026). Research may focus on digital infrastructure, public services, organizational transformation, or policy processes independently. Consequently, it remains difficult to determine from individual studies which concepts occupy central positions in the broader digital governance literature and which themes are comparatively less developed (Da Silva & Texeira, 2020).

Research Gap

The literature reviewed above reveals a conceptual progression from e-government toward digital governance. Early research emphasizes ICT adoption and digital service delivery, while more recent studies increasingly address organizational transformation, collaboration, data governance, citizen engagement, cybersecurity, and policy processes (Refat et al., 2023). Nevertheless, the literature remains distributed across different technologies, institutions, and analytical perspectives. Existing studies provide valuable empirical and conceptual insights, but they do not systematically reveal the relationships among these research themes or their development within Indonesian scholarship (Pribadi et al., 2024). This gap justifies using bibliometric analysis to identify publication trends, thematic relationships, dominant research clusters, emerging topics, and underexplored areas. Accordingly, this study positions digital governance as the central research domain, with digital transformation, e-government, public administration, data governance, citizen engagement, and public policy representing interconnected dimensions of the literature. This conceptual synthesis provides the basis for the subsequent VOSviewer analysis (Hilary & Serret, 2024).

3. Research Methods

This study employs a bibliometric analysis to examine the development and research trends of digital governance in Indonesia. The bibliographic data were obtained from the Scopus database using predefined search and selection criteria. The literature selection process followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework to ensure a transparent and systematic identification and screening of relevant publications (Wahyuni & Herman, 2025). The selected publications were then analyzed using VOSviewer to examine publication trends, author and institutional contributions, keyword co-occurrence, and the development of research themes.

The bibliometric analysis involved network, overlay, and density visualizations to identify dominant, interconnected, emerging, and relatively underexplored themes within the literature. The analysis focused on the structure and development of the research field rather than on primary qualitative data obtained

through interviews or observations (Nadzar et al., 2017). Therefore, the study is positioned as a bibliometric study of Scopus-indexed literature, with the findings interpreted based on patterns and relationships identified in the bibliographic dataset.

The literature search was conducted using the Scopus database. To identify publications relevant to digital governance research in Indonesia, a Boolean search strategy was applied using the following search string: Scopus Search String TITLE-ABS-KEY ("digital governance" OR "digital transformation" OR "e-government") AND TITLE-ABS-KEY (Indonesia OR Indonesian). The search was conducted and accessed from 2020 to 2025. The retrieved records were screened against the predefined inclusion and exclusion criteria, following the PRISMA framework. The final dataset was then analyzed using VOSviewer to identify publication trends, author and institutional contributions, keyword co-occurrence, and thematic relationships.

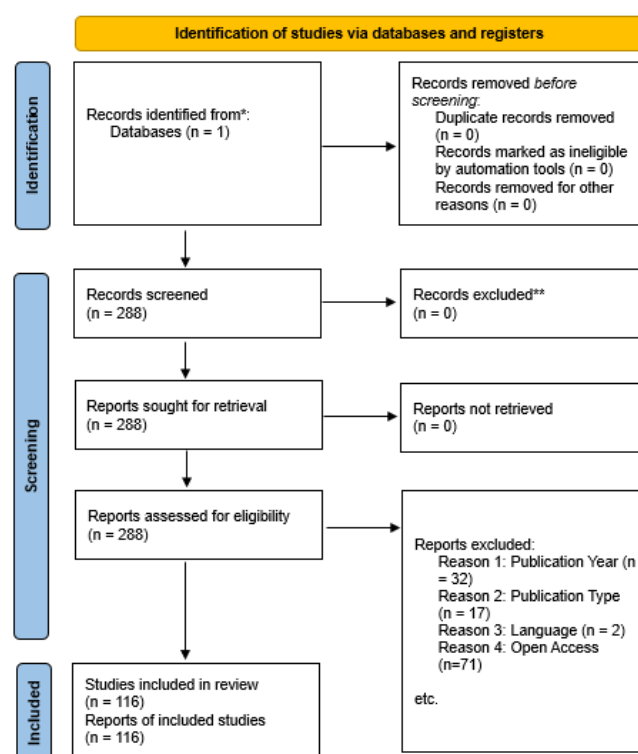


Figure 1. PRISMA Diagram

The literature selection process followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework to ensure a systematic and transparent screening procedure. A total of 288 records were initially identified from the Scopus database. We then screened the records against predefined inclusion and exclusion criteria, including publication year, document type, language, and open-access status. The screening and eligibility stages were carefully reviewed and reconciled with the PRISMA flow diagram presented in Figure 1. Only publications that satisfied all eligibility criteria were retained for the final bibliometric analysis. The final number of included publications was subsequently used consistently throughout the Abstract, Methods, Results and Discussion, and Conclusion sections.

This study used VOSviewer, a program that performs bibliometric analysis and depicts associations among publications, keywords, authors, and relevant research institutions. We used VOSviewer to examine Scopus data and identify research trends and relationship patterns related to governance, public policy efficacy, and digital transformation. We mapped keyword co-occurrence as part of the analysis, producing density, overlay, and network visualizations (Mishra & Mishra, 2023). The map shows the key issues most commonly researched in digital governance and highlights the strength of connections between research topics. Thus, by using VOSviewer, researchers can identify research gaps that can support this study's

academic contribution while also gaining a thorough understanding of scientific advancements and global research orientations. Following that, an examination of the search results reveals Documents by year, Documents by country, Documents by author, and Documents by affiliation based on the Scopus keywords "Digital" AND "Governance" AND "Indonesia."

4. Results and Discussion

Development of Digital Governance Research in Indonesia

The bibliometric analysis shows that digital governance research in Indonesia has increased, reaching approximately 40 publications in 2024 before declining slightly in 2025. This indicates that digital governance has become an established research agenda in public administration. The findings are consistent with studies that emphasize organizational, institutional, and strategic dimensions of digital transformation. From a governance perspective, the literature reflects a shift from technology adoption toward broader administrative and institutional transformation. However, the bibliometric findings show thematic connections rather than causal effects on governance or policy effectiveness.

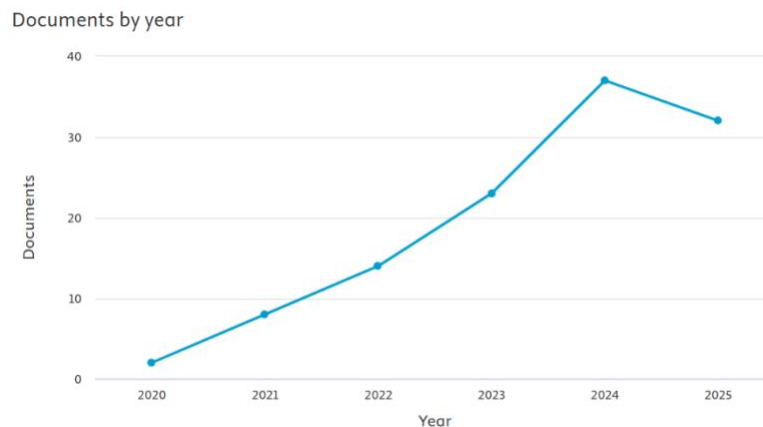


Figure 2. Publication of Research by Years

Figure 2. The aforementioned Documents by Year graph shows an increasing trend in the number of scientific publications in the Scopus database containing the keywords "Digital," "Governance," and "Indonesia" between 2020 and 2025. The number of publications was still quite small in 2020, but the graph shows that the number of documents increased significantly year to year, reaching a peak of about 40 documents in 2024. With the issuance of several national strategic policies, including the implementation of the Electronic-Based Government System (SPBE) and the acceleration of public service digitalization, this increase reflects academics' growing attention to digital transformation and governance in Indonesia. Despite a minor downturn in 2025, the overall pattern indicates that digital governance

remains a significant area of study for public policy and contemporary governance in Indonesia.

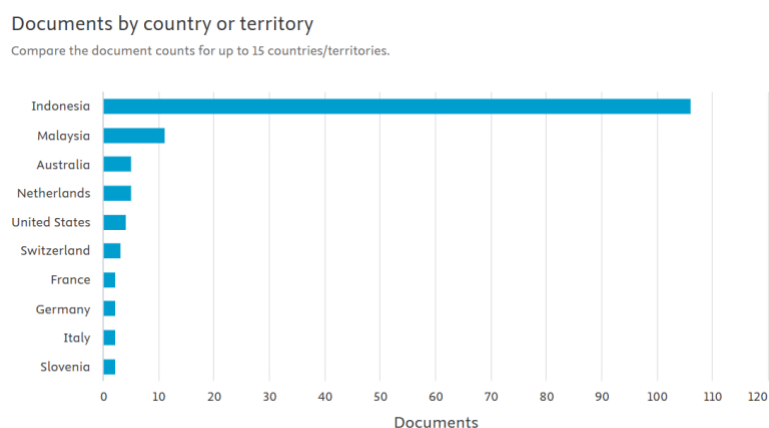


Figure 3. Country- Publication

Figure 3. The distribution of scientific publications by nation on the subjects of "Digital," "Governance," and "Indonesia" in the Scopus database is displayed in the Documents by Country or Territory graph above. Indonesia has the most publications—more than 100 documents—showing how prevalent and highly regarded digital transformation and governance are among domestic scholars. Malaysia comes next, followed by Australia, the Netherlands, and the US, indicating cross-national research collaboration in Indonesian studies on digital governance. Although in relatively minor amounts, contributions were also made by Switzerland, France, Germany, Italy, and Slovenia. This pattern shows that international academics, particularly those from nations with a strong research heritage in public policy and digital governance, are interested in digital governance in Indonesia in addition to local researchers.

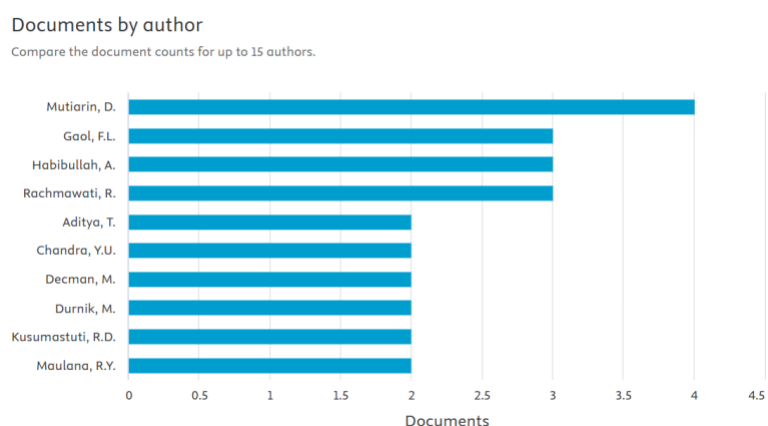


Figure 4. Publication by the Authors

Figure 4. According to statistics from Scopus, the writers with the most publications on the subjects of "Digital," "Governance," and "Indonesia" are displayed in the graph of documents by author above. With four works focused on analyzing digital governance and public policy in Indonesia, Mutiara, D. is clearly the most prolific author. Additionally, other writers such as Habibullah, A., Rachmawati, R., and Gaol, F.L., each have three publications, indicating their active participation in the growth of the literature on digital transformation in the public sector. Furthermore, two pertinent papers in related disciplines are also held by scholars like Aditya, T., Chandra, Y.U., Decman, M., Durnik, M., Kusumastuti, R.D., and Maulana, R.Y. All things considered, this graph demonstrates that digital governance research in Indonesia is expanding due to the active involvement of scholars from both domestic and foreign partnerships, enhancing the body of knowledge about contemporary technology-based governance.

Institutional and Administrative Dimensions

The publication distribution shows that major Indonesian universities, particularly the University of Indonesia, UMY, BINUS, and UGM, contribute substantially to digital governance research. This indicates an established research field, although publication counts do not necessarily reflect collaboration. The concentration also highlights the need for future research on institutional capacity, inter-organizational coordination, and local government contexts, consistent with.

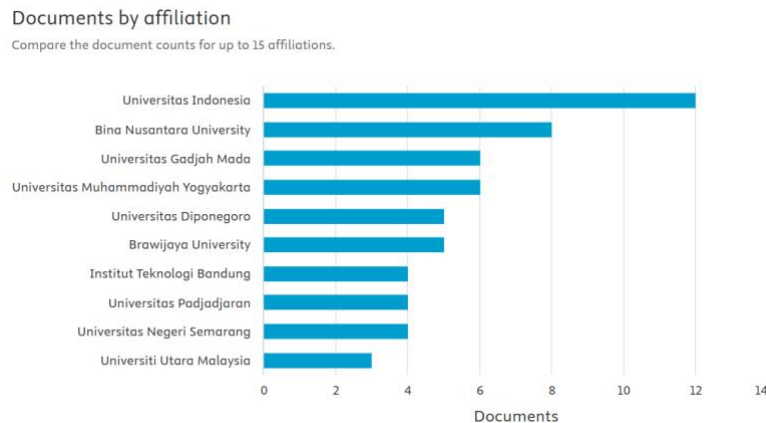


Figure 5. Publication based on Affiliation

Figure 5. The distribution of scientific publications according to the affiliation of academic institutions studying the topics "Digital," "Governance," and "Indonesia" in the Scopus database is displayed in the Documents by Affiliation graph above. With over 12 publications, the University of Indonesia has the most publications, indicating its leading position in the study of governance and digital transformation. Following it are Muhammadiyah University Yogyakarta, Bina Nusantara University, and Gadjah Mada University, all of which actively publish scholarly works in related subjects. Other academic institutions that have made noteworthy contributions include Padjadjaran University, Bandung Institute of Technology, Brawijaya University, Diponegoro University, and Semarang State University. Universiti Utara Malaysia's inclusion on this list reflects cross-border research cooperation in Southeast Asia. Overall, this graph shows that support for technology-based governance is part of the national and regional academic agenda and that research on digital governance in Indonesia has become a prominent priority at several large universities.

In order to create interconnected research theme clusters, the co-occurrence of keywords—that is, the correlation between the joint presence of keywords in documents—was mapped using VOSviewer. Two different visualizations were used to show the mapping results: (1) overlay visualization, which shows the evolution of themes over time by providing layers of temporal information or other metrics (such as average year of publication or citations); and (2) density visualization, which shows the density and intensity of keyword occurrences—more "dense" coloured areas indicate dominant research focuses. The thorough identification of core themes, sub-themes, and research gaps on the subject of digital transformation in governance is made possible by the combination of these three maps.

Dominant Themes and The Shift from E-government to Digital Governance

The keyword analysis identifies digital transformation, e-government, public administration, public policy, data governance, and decision-making as dominant themes. Compared with earlier technology-oriented studies, the findings indicate a shift toward broader institutional, policy, and governance dimensions. This suggests that digital governance is increasingly viewed as a multidimensional process

involving technology, institutions, policy, and information management. However, the findings represent thematic associations and do not establish causal effects on policy or governance outcomes.

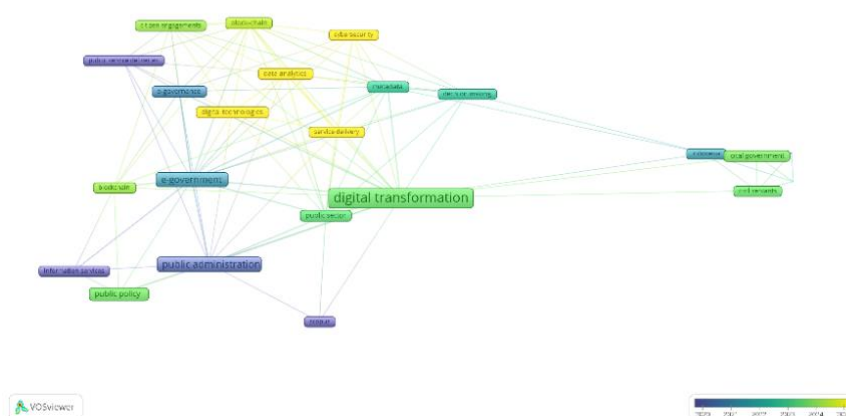


Figure 6. Co-occurrence of Keywords

Figure 6. The results of using VOSviewer to map the co-occurrence of keywords are displayed above as an overlay visualization. Thematic links between keywords that commonly occur together in literature about "Digital," "Governance," and "Indonesia" are depicted in this map. The network's primary hub is evidently the term "digital transformation," which has close ties to terms like "e-government," "public administration," "public policy," "data governance," and "decision-making." The network's colors show the topics' emergence chronologically, with yellow denoting more recent, emerging themes and blue denoting earlier studies. The study's focus on digital technology in governance is reflected in the close connection between public administration and digital transformation. Meanwhile, the rise of terms like citizen engagement, cybersecurity, and local government suggests that study topics are becoming more focused on security, public involvement, and local governance. Overall, this map shows that digital transformation is a key issue in strengthening Indonesia's modern governance.

Emerging Themes: Citizen Engagement, Cybersecurity and Local Government

The overlay and density analyses identify citizen engagement, cybersecurity, and local government as emerging themes. These findings indicate that digital governance research is expanding beyond technological and administrative modernization toward citizen participation, digital security, and local governance contexts. The growing attention to cybersecurity is consistent, while citizen engagement highlights citizens' increasing role in digital governance. However, these themes remain less established than the dominant themes, indicating important opportunities for future research on citizen participation, public trust, institutional legitimacy, and cybersecurity. Since bibliometric analysis only shows thematic relationships, their actual effectiveness requires further empirical investigation.

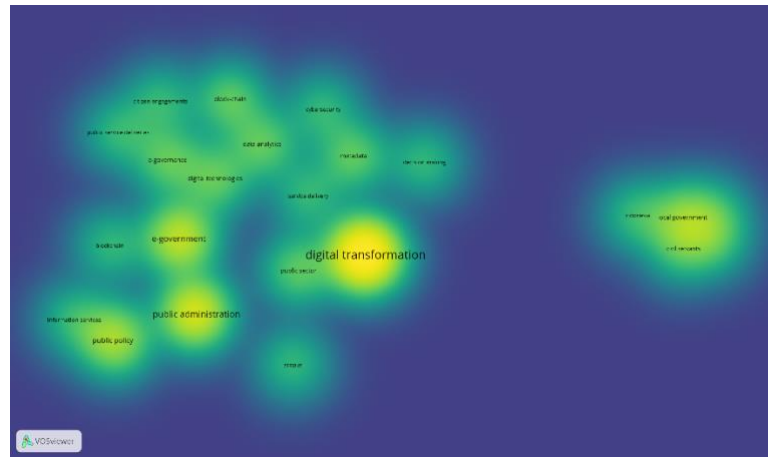


Figure 7. Co-occurrence

Figure 7. The density visualization below shows keyword co-occurrence among the topics "Digital," "Governance," and "Indonesia" from the VOSviewer study. Green to blue denotes lower intensity, while yellow represents regions with a high frequency of keyword occurrence and is the study's emphasis. As shown, the term "digital transformation" holds the most prominent and dense position, suggesting that this issue is the primary focus of Indonesian literature on digital governance. Dense clusters formed by additional keywords like "public administration," "e-government," and "public policy" further suggest a close connection between public policy and digital change. A new study focus that emphasizes the implementation of digital transformation at the local government level appears to be emerging, since keyword groups like "local government" and "civil servants" seem to form distinct clusters. Overall, this map demonstrates that Indonesian research on digital governance focuses on the public sector's digital transformation, with studies branching out to encompass local and participatory facets of governance.

Research Implication for Public Governance

The findings reveal a shift from technology-centered e-government to broader digital governance, linking digital transformation to public administration, policy, data governance, and decision-making. This perspective emphasizes that digitalization involves not only technology but also institutions, policy processes, data, and citizens (Aliamutu & Rudolph, 2025). The emerging themes of citizen engagement, cybersecurity, and local government further indicate important areas for future research. Therefore, studies should examine digital governance within specific institutional and regional contexts, particularly regarding administrative capacity, inter-organizational coordination, citizen participation, and digital security (Jaimes et al., 2026).

The central contribution of the bibliometric findings is therefore not simply the identification of the most frequently occurring keywords or the institutions with the highest publication output. More importantly, the analysis demonstrates the changing intellectual orientation of digital governance research in Indonesia (Cassandra et al., 2025). The literature is moving from a relatively narrow emphasis on e-government and technological applications toward a broader governance framework involving administration, public policy, data, decision-making, participation, and security. This development supports the institutional and organizational emphasis found in previous studies, while also revealing research areas that require further empirical attention (Reji et al., 2025). However, the bibliometric approach has an important limitation: thematic co-occurrence indicates relationships within the literature but does not establish causal relationships among the concepts. Therefore, empirical research should test claims about improvements in policy effectiveness, transparency, participation, or administrative performance. The present study therefore provides a research map to guide future qualitative,

quantitative, and comparative studies of digital governance in Indonesia (Muallidin & Supratikta, 2026).

5. Conclusion

This study maps the development of digital governance research in Indonesia through bibliometric analysis of Scopus-indexed publications. The findings indicate that digital transformation, e-government, public administration, public policy, data governance, and decision-making constitute central themes in the literature, while citizen engagement, cybersecurity, and local government represent emerging areas of research. These thematic patterns indicate a broader shift from technology-oriented e-government toward a multidimensional understanding of digital governance that includes institutional, administrative, policy, data, and citizen-oriented dimensions. The study contributes to the literature by identifying the structure, dominant themes, and emerging directions of digital governance research in Indonesia. However, the findings represent patterns within the bibliographic literature and should not be interpreted as direct causal evidence of the effects of digital transformation on governance or policy effectiveness.

Based on these findings, future research and policy development should focus more on integrated data governance, digital capacity within public institutions, cybersecurity, citizen engagement, and locally grounded digital governance practices. Further empirical research is particularly needed to examine how these emerging themes are implemented across different institutional and regional contexts in Indonesia.

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