
ANALYSING DIGITAL TRANSFORMATION IN INDONESIA: THE GOVERNMENT'S ROLE IN IMPROVING PUBLIC SERVICES FOR ECONOMIC ACTIVITY

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ABSTRACT

This study examines the strategic role of the Indonesian government in promoting digital transformation as a key instrument for improving public services and supporting economic activities. While previous studies have widely discussed digital transformation from technological and administrative efficiency perspectives, limited attention has been given to its direct impact on community-based economic activities. Addressing this gap, the study aims to analyze government digital policy strategies, evaluate the implementation of digital public services, and assess their contribution to creating a more inclusive and responsive economic environment. A qualitative descriptive-analytical approach is employed, supported by bibliometric analysis using secondary data from the Scopus database. Documents published between 2015 and 2025 were analyzed using RStudio to identify publication trends, dominant themes, and knowledge structures related to digital transformation in the public sector. The findings reveal a significant increase in global research on digital transformation, with an annual growth rate, indicating its growing relevance in governance and economic development. Digital transformation is found to represent a structural shift in public service delivery rather than merely technological adoption. In Indonesia, government-led digital initiatives have improved bureaucratic efficiency, expanded market access, and supported the growth of digital economic actors, particularly MSMEs and startups. This study concludes that digital transformation plays a crucial role in strengthening public service performance and accelerating inclusive economic growth. The findings provide theoretical contributions to digital governance literature and practical insights for evidence-based policymaking in Indonesia.

A. INTRODUCTION

Digital transformation has become a central pillar of contemporary public governance, driven by its potential to enhance public service efficiency, stimulate economic growth, and improve state responsiveness to societal needs. Governments across the world are increasingly leveraging digital technologies to modernize administrative processes, expand service accessibility, and foster inclusive

economic ecosystems (Rashdi, 2024). In the context of national development, digital transformation is no longer perceived merely as a technological upgrade but as a strategic governance instrument capable of reshaping economic structures and public value creation. Previous studies have demonstrated that digital transformation contributes significantly to economic growth by reducing transaction costs, expanding market access, and strengthening financial inclusion, particularly for micro, small, and medium enterprises (MSMEs) (Meng & Gong, 2024). Furthermore, the integration of digital platforms into public services has facilitated co-production mechanisms, enabling citizens and economic actors to actively participate in service design and delivery. However, the rapid expansion of digital public services also introduces governance challenges related to infrastructure readiness, regulatory frameworks, digital literacy, and institutional coordination (Mutiarin et al., 2024).

Several countries, such as Australia, Denmark, and the Republic of Korea, have successfully implemented digital government strategies through coordinated governance models and intergovernmental collaboration, resulting in user-centered and integrated public services. These international experiences underline the importance of strong governmental leadership in steering digital transformation (Welby & Ubaldi, 2023). In developing countries, including Indonesia, digital transformation has gained increasing policy attention as part of broader efforts to modernize governance and accelerate digital economic development. National initiatives such as electronic government systems, online licensing platforms, and application-based public services reflect the government's commitment to digitalizing administrative processes (Fathonih et al., 2020).

Despite this growing policy momentum, empirical studies on digital transformation in Indonesia's public sector have predominantly focused on technological adoption, administrative efficiency, or governance performance in isolation (Danar, 2024). Limited scholarly attention has been paid to how government-led digital transformation directly influences community-based economic activities, particularly in terms of supporting MSMEs, digital startups, and inclusive economic participation (Saputra et al., 2023). As a result, the causal relationship between digital public service transformation and tangible economic outcomes remains insufficiently explored.

The necessity of digital transformation in the context of national development is underscored by its capacity to stimulate economic growth, enhance competitiveness, and address social and economic challenges. To reap the full benefits of DT, strategic investments and coordinated efforts are essential (Ahmed, 2023). The transition towards digital public services poses considerable challenges, particularly in infrastructure sectors such as transport, energy, and communications. Digital interfaces that serve as intermediaries between traditional services and citizens necessitate the establishment of novel regulatory frameworks (Finger & Montero, 2023). This assertion is substantiated by the observation of an escalation in the number of patent applications in regions that have been shown to possess advanced marketing methodologies and a robust intellectual property rights protection framework (Zhou, 2025).

Digital transformation has been demonstrated to have the potential to significantly boost economic growth by expanding market access, improving service delivery, and increasing financial inclusion (Ateeq, 2025). The integration of co-production, which involves the engagement of citizens in the design and delivery of services, with nudging, a term used to describe behavioral intervention techniques, has the potential to enhance public services by aligning them more closely with citizens' needs. Digital technology plays an instrumental role in facilitating this engagement (Sorrentino et al., 2022). The accelerated evolution of digital services and platforms has engendered an environment conducive to the proliferation of intricate digital ecosystems, which are predicated on these services and platforms. Consequently, there is a growing demand for the regulation of this novel phenomenon through national legal norms (Isaeva et al., 2024).

Digital transformation is imperative for the promotion of economic growth and competitiveness. It has been demonstrated to facilitate the restructuring of national economies, the enhancement of productivity, and the promotion of innovation (Doan et al., 2025). A number of countries, including Australia, Denmark, and the Republic of Korea, have achieved success in the digitization of public services through strategic governance and intergovernmental cooperation. This has resulted in the provision of user-centered and integrated services (Nielsen & Jordanoski, 2023). The implementation of digital government policies has been demonstrated to have a significant impact on the level of regional innovation, particularly in areas characterized by advanced marketing, robust intellectual property rights protection, superior network infrastructure, and supportive business credit conditions (Gan et al., 2024).

The present study introduces an element of novelty by its specific examination of the active role of the Indonesian government in integrating digital transformation as a strategic instrument to improve public services that support national economic activities. Contrary to the focus of preceding studies, which have predominantly centered on technological facets or bureaucratic efficiency in general, this research makes a novel contribution by underscoring the causal relationship between government digital policies and their impact on the economic dynamics of society, encompassing SMEs, digital startups, and e-commerce services. This study employs an analytical approach to national digital policies and their implementation in public services, thereby expanding the existing body of knowledge on how state-managed digital transformation can catalyze inclusive economic growth in the digital age.

The Ministry of Home Affairs (Kemendagri RI) has initiated the deployment of several applications to enhance public services. However, the implementation of these initiatives has been impeded by two primary factors: first, the absence of adequate infrastructure, and second, the presence of overly rigid SOPs (Komang Lusinta et al., 2024). The Ministry of Agrarian Affairs and Spatial Planning/National Land Agency (ATR/BPN) is currently modernizing its IT infrastructure and developing online e-services to realize comprehensive digital services (Bennett et al., 2023). Digital transformation in village governance is being addressed through applications such as Simpledesa, which has been demonstrated to improve service delivery and community engagement. However, challenges such as limited digital literacy and inadequate infrastructure persist (Kaynanda & Zarlis, 2024).

Governments frequently formulate comprehensive national digital strategies with the objective of promoting social and economic development. These strategies entail negotiations among various stakeholders and are designed to establish a long-term vision and the appropriate institutions to ensure sustainable growth (Sandoval-Almazán et al., 2017). Governments are increasingly integrating various digital services to create integrated public services. This development poses governance challenges that must be addressed through an evolving governance regime (Wouters et al., 2020). The digital government initiative aspires to enhance service delivery by automating routine tasks, reducing manual workload, and improving accessibility and efficiency. The initiative also promotes transparency and accountability in government operations (Selvakumar et al., 2025).

Numerous regions encounter challenges due to insufficient ICT infrastructure and limited digital literacy, which impedes the integration of digital technology (Fikri & Huda, 2024). Digital technology has been demonstrated to reduce various economic costs, including search, replication, transportation, tracking, and verification costs. Consequently, digital technology has been shown to boost economic activity (Goldfarb & Tucker, 2019). Despite considerable challenges, the digital transformation in Indonesia's public sector persists. Addressing issues related to infrastructure, digital literacy, and governance is critical to the successful implementation of digital initiatives. It is imperative to acknowledge the significance of collaborative endeavors and continuous training in surmounting the identified impediments and attaining the envisioned outcomes in the realm of public service delivery (Maulana et al., 2024).

Despite the existence of prior studies that have addressed digital transformation in the public sector and the evolution of the digital economy in Indonesia, the majority of these studies have yet to integrate government policy dimensions with their direct impact on community economic activities. There have been few comprehensive studies that have reviewed how the government's strategic role in designing and implementing digital transformation can improve the quality of public services while promoting economic growth, particularly in the context of an inclusive digital ecosystem. This research gap underscores the absence of a comprehensive correlation between public service digitalization initiatives and their impact on tangible economic activities. The objective of this study is to address this gap by adopting an analytical approach that integrates digital governance, public policy, and community economic activities cohesively.

The objective of this study is to examine the role of the Indonesian government in promoting digital transformation to enhance the effectiveness and accessibility of public services, which in turn has a direct impact on community economic activities. Specifically, this study seeks to identify the digital policy strategies implemented, evaluate the implementation of public service digitization programs, and assess the extent to which such transformation can create a more inclusive, efficient, and responsive economic environment. This approach is intended to facilitate the formulation of strategic recommendations for the government, to enhance digital governance and thereby promote sustainable economic growth in the digital age.

Digital transformation is defined as the process of leveraging cutting-edge technology across various domains of business to maintain competitiveness in a rapidly evolving environment. (Alzarooni et al., 2024). Digital transformation has profoundly impacted the delivery of public services; however, research on public engagement with e-Government services in Qatar remains sparse. Despite substantial investment in digital governance, 70% of services persist in being accessed through traditional methods, suggesting barriers to adoption (Elayah, 2025). In the contemporary era, governments across the globe are progressively adopting e-Government services with the objective of enhancing the efficiency of administrative processes and aligning with citizens' expectations. The present study investigates the quality of e-Government services from the perspective of citizens in 50 Greek municipalities (Patergiannaki & Pollalis, 2024).

However, the concept extends beyond the mere computerization of routine business administration. E-government is defined as the use of technology by governmental entities to provide citizens with more efficient and expeditious access to information and services (Spasojević, 2015). Organizations that practice good governance consist of educated members who are involved in the decision-making process (Landa & Greenberg, 2024). Administrative practices have long been acknowledged as a pivotal instrument in fostering sound governance. A substantial body of evidence indicates that good governance exerts a significant influence on citizens' behavior toward the government. This study utilizes an empirical approach to examine the relationship between good governance and public trust, exploring the potential mediating role of e-government in this context (Jameel et al., 2019).

The digital economy is inextricably linked to the operational processes of companies, thereby propelling heightened levels of corporate innovation. To this end, a theoretical model was developed to verify the positive relationship between public digitization and corporate innovation (Qiu et al., 2025). Despite the rapid growth of the digital economy in recent years, the motivation for organizational digital innovation remains low, and the existing data market is significantly smaller than its true value. The majority of extant studies have proposed factors that influence digital innovation from an organizational perspective, while the impact of external environmental factors has been neglected to a certain extent (Xia & Md Johar, 2025). In recent times, the digital economy has assumed a pivotal role in stabilizing the economy and propelling innovation, exhibiting dynamic and creative economic characteristics. (Xiaodi & Meixian, 2023).

Despite the considerable potential of digital technology to enhance socioeconomic development, its impact varies across developing countries. This study investigates the influence of internet and mobile penetration on economic growth and human development indices in 30 developing countries from 2008 to 2023 (David et al., 2025). Furthermore, this study identifies the challenges, opportunities, and key strategies for digitalization and digital transformation (Sumbal et al., 2024). The comparative study under scrutiny herein highlights the various impacts of digital transformation in different countries. For instance, China, Malaysia, and India have strategically employed technological advancements to stimulate economic growth and enhance competitiveness. A robust correlation has been observed between digital penetration and GDP growth in Ghana, Indonesia, and Venezuela (Voronkova et al., 2024).

The development of digital transformation in Society 5.0 in Indonesia is the focus of this study, to identify the challenges and opportunities inherent in its implementation (Rohayati & Abdillah, 2024). The digital divide persists as a substantial challenge in Indonesia, particularly in various regions, characterized by disparate access to digital infrastructure, competencies, and economic prospects (Jaya et al., 2024). Digital transformation is occurring at an accelerated pace in all industries during this era of IR 4.0, encompassing both developing and developed countries. The healthcare sector, in particular, is undergoing a digital transformation to enhance its services (Said & Samuel, 2024).

Digital transformation has the potential to improve resource efficiency and reduce waste; however, there are many obstacles hindering its implementation (Pittri et al., 2025). Digital transformation has emerged as a prominent concept in the government's manifesto, which aims to establish the nation as a leader in the adoption of digital technology. This phenomenon is being implemented in all areas of society, including health, education, agriculture, and the economy. It is often implemented under the agenda or guise of sustainability, a term that has been overused and has lost its original meaning (Lim, 2024). However, the advent of the Coronavirus disease 2019 (COVID-19) pandemic has had a profound impact on numerous facets and elements of small- and medium-

sized enterprises (SMEs). In response to the pandemic, one transition has been accelerated, namely, digital transformation (Hartono et al., 2023).

This study addresses **this research gap** by examining the strategic role of the Indonesian government in integrating digital transformation as a policy instrument to improve public services that support economic activities. Unlike previous studies that emphasize technological dimensions alone, this research offers a novel contribution by linking digital governance policies with their economic implications for society. By employing a bibliometric and qualitative analytical approach, this study provides a comprehensive assessment of global research trends while contextualizing Indonesia's digital transformation within broader public sector and economic development frameworks.

Accordingly, the objectives of this study are threefold: (1) to identify government digital policy strategies related to public service transformation; (2) to evaluate the implementation of digital public services in supporting economic activities; and (3) to assess the extent to which digital transformation contributes to a more inclusive, efficient, and responsive economic environment in Indonesia. The findings of this research are expected to contribute both theoretically to the literature on digital governance and practically to evidence-based policymaking for sustainable digital transformation in the public sector.

B. METHOD

This study employs a qualitative descriptive-analytical research design to examine the role of the Indonesian government in driving digital transformation and its implications for public services supporting economic activities (Kamal et al., 2025). This approach is appropriate for capturing complex policy dynamics, institutional strategies, and socio-economic impacts of digital transformation that cannot be adequately explained through quantitative measurements alone.

To strengthen analytical rigor, this research integrates bibliometric analysis as a complementary method to identify global research trends, dominant themes, and knowledge structures related to digital transformation (Ruirui & Hashim, 2025). Bibliometric analysis enables a systematic mapping of scientific literature, providing contextual insights into how digital transformation has evolved within public sector governance and economic development discourses. The study relies on secondary data obtained from reputable academic sources, primarily the Scopus database. Scopus was selected due to its comprehensive coverage of high-quality, peer-reviewed international journals (Baas et al., 2020). Data collection was conducted using the keyword "Digital Transformation", with publication years limited to 2015–2025, to ensure the relevance and currency of the literature.

The search strategy applied specific inclusion criteria:

- (1) subject area restricted to Social Sciences,
- (2) document types limited to articles, conference papers, and reviews,
- (3) sources published in English,
- (4) journal-based publications, and
- (5) open-access availability.

This strategy yielded 2,904 eligible documents, which formed the analytical corpus of the bibliometric review. The selection process followed transparent screening procedures adapted from the PRISMA framework to ensure methodological consistency and academic credibility. TITLE-ABS-KEY ("Digital Transformation") AND PUBYEAR > 2015 AND PUBYEAR < 2025 AND (LIMIT-TO (SUBJAREA, "SOCI")) AND (LIMIT-TO (DOCTYPE, "ar")) OR LIMIT-TO (DOCTYPE, "cp") OR LIMIT-TO (DOCTYPE, "re")) AND (LIMIT-TO (SRCTYPE, "j")) AND (LIMIT-TO (LANGUAGE, "English")) AND (LIMIT-TO (PUBSTAGE, "final")) AND (LIMIT-TO (OA, "all")).

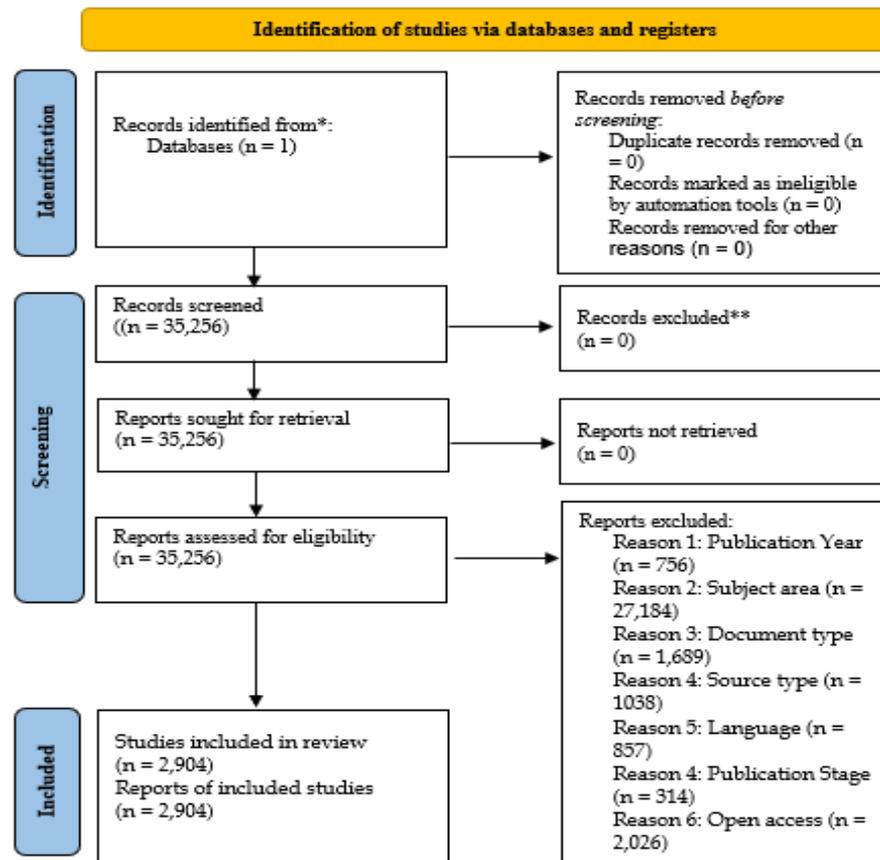


Figure 1. PRISMA diagram

(Source: Created by Author)

Figure 1. The data collection and selection process in this study was carried out systematically through a single database, which generated 35,268 initial records. At the initial stage of the screening process, no records were deleted, including those that were duplicates, automatically ineligible, or for any other reason. Subsequently, a comprehensive evaluation was conducted on all records, with no excluded or inaccessible records identified. A total of 35,268 reports were reviewed; however, 32,364 were excluded from the study due to noncompliance with the established criteria. The primary reasons for exclusion included: not aligned with the field of study (n = 27,184), irrelevant document type (n = 1,889), source type (n = 1,038), and language mismatch (n = 857). Following a thorough selection process, 2,904 final reports were determined to be eligible and were incorporated into the review. The figure illustrates the rigorous and transparent methodology employed in the selection of pertinent and high-quality literature for further analysis in this study.

Bibliometric data were analyzed using RStudio, an integrated development environment (IDE) based on the R programming language. RStudio was selected for its capacity to efficiently process large datasets and generate visual and statistical outputs. The analysis included publication growth trends, source productivity, author and institutional contributions, keyword frequency, thematic clustering, and co-occurrence network visualization (Komperda, 2017). The bibliometric findings were subsequently interpreted using qualitative analytical techniques to link global research patterns with the Indonesian context. This interpretive stage enabled the identification of the government's strategic role in digital transformation, particularly in improving public services and facilitating economic activities such as MSME development, digital entrepreneurship, and service accessibility (Latupeirissa et al., 2024). To ensure analytical rigor, this study employed data triangulation by combining bibliometric evidence with policy and governance interpretations drawn from the literature. The use of

Scopus-indexed sources enhances the credibility and reliability of the findings, while the integration of qualitative interpretation allows for contextual depth beyond numerical trends. This methodological combination provides a robust framework for analyzing digital transformation as both a governance strategy and an economic enabler.

C. RESEARCH FINDING AND DISCUSSION

The bibliometric analysis of Scopus-indexed publications processed using RStudio reveals a substantial and consistent increase in scholarly attention to digital transformation between 2015 and 2025. A total of 2,904 documents from 824 sources were identified, with an annual publication growth rate of 52.34%, indicating that digital transformation has become a dominant and rapidly expanding research agenda within public sector governance and economic development studies.

Keyword frequency analysis demonstrates that *digital transformation* is the most prevalent term, followed by *digitalization*, *innovation*, and *sustainability*. This pattern confirms that digital transformation is not confined to technological adoption but is increasingly associated with institutional innovation, sustainable governance, and socio-economic development. The co-occurrence network further illustrates three interconnected thematic clusters: technological systems (e.g., artificial intelligence and information technology), economic development (e.g., innovation and growth), and human capital development (e.g., education and skills).

Country-level analysis shows that China dominates scientific production in this field, followed by Indonesia, which ranks second among contributing countries. This finding highlights Indonesia's growing academic and policy interest in digital transformation, particularly within the public sector. Institutional analysis also indicates increasing contributions from Indonesian universities, reflecting the strengthening of national research capacity in digital governance.

A bibliometric analysis of the Scopus database, processed through RStudio, revealed a marked upward trend in scientific publications of the term "Digital Transformation" over the past decade (2015-2025), particularly in the context of the public sector and economic development in developing countries, including Indonesia. The Visualization of Analysis Results The frequency of keywords indicates that digital transformation is not merely the adoption of technology; it is also a structural change in the manner in which governments provide services to the public. In Indonesia, these findings reflect the crucial role of the government as the primary catalyst for public service digitalization, which, in turn, promotes bureaucratic efficiency and accelerates the growth of digital economic activities.

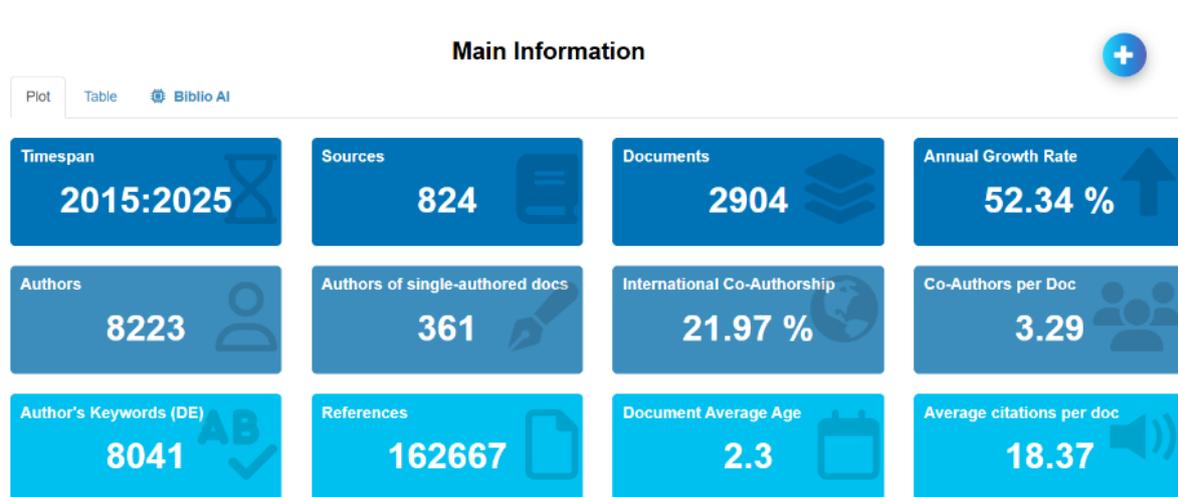
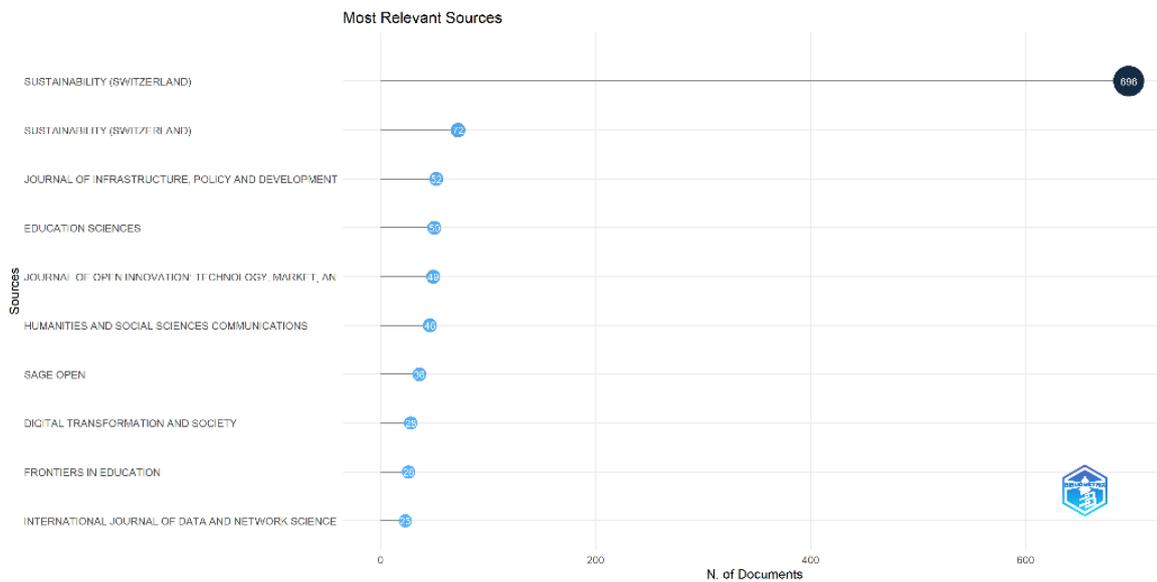


Figure 2. Data Main Information
(Source: RStudio 2025)

Figure 2 A comprehensive analysis of bibliometric data processed through RStudio from the Scopus database on the subject of "Digital Transformation" for the period 2015–2025 reveals a total of 2,904 documents from 824 sources, with an annual publication growth rate of 52.34%. This high figure indicates that digital transformation is a highly relevant and continuously evolving issue in scientific literature. The total number of authors reached 8,223, with an average of 3.29 authors per document.

Furthermore, the international collaboration rate reached 21.97%, indicating a collaborative trend across countries in discussing this topic. The number of keywords recorded by authors is 8,041, reflecting the diversity of research focus, while the number of references used reaches 162,667. The average age of the documents is 2.3 years, indicating that research in this field is dominated by recent



and relevant works. The mean number of citations per document is 18.37, suggesting that this subject is highly appealing and has made significant contributions to the academic world. These findings underscore the notion that digital transformation, particularly in the context of public services and the economy, is a global concern that must be addressed by Indonesia's government policies.

Figure 3. Data Most Relevant Sources
Source: RStudio (2025)

Figure 3. As indicated by the "Most Relevant Sources" graph, the journal Sustainability (Switzerland) is the most prominent source of scientific publications related to digital transformation, with a noteworthy number of 696 articles. This predominance underscores the journal's status as a preeminent platform for researchers to disseminate their studies on sustainability and digitalization. In the subsequent position, the same journal is also listed with another 72 documents, which may be indicative of double indexing or special editions. Other journals that have published relevant articles include the Journal of Infrastructure, Policy and Development (52 documents), Education Sciences (50), and the Journal of Open Innovation: Technology, Markets, and Complexity (49) also plays a substantial role in knowledge dissemination. This diversity of sources reflects the multidisciplinary approach to the study of digital transformation, encompassing issues of education, policy, innovation, and social communication.

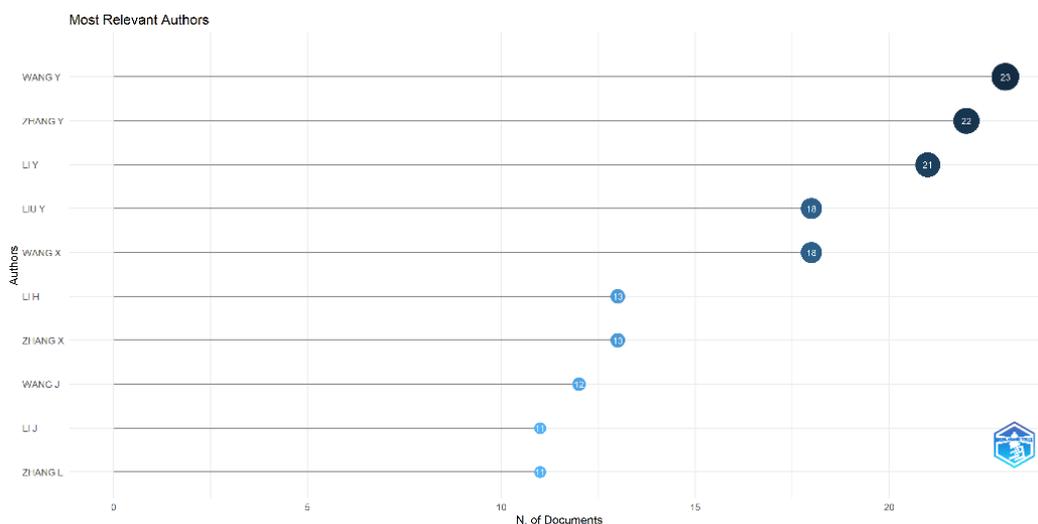


Figure 4. Data, Most Relevant Authors

Source: RStudio (2025)

Figure 4. A close examination of the "Authors' Production over Time" visualization from the bibliometric analysis, executed using RStudio, reveals a consistent upward trend in the publication of materials related to the subject of "Digital Transformation," which persisted from 2020 to 2025. LIU Y. and ZHANG X. demonstrate the highest level of productivity, with the number of articles reaching more than nine publications in a single year, as illustrated by the size of the largest circle on the graph. Their scholarly contributions have been shown to exhibit high annual citation rates (TC per Year), which serves as an indication that their work exerts a considerable influence within academic discourse. The graph demonstrates the consistency and intensity of research conducted by the lead authors, reflecting a global trend of increasing exploration and development of the concept of digital transformation, particularly in the context of public services and the economy. These findings underscore the significance of sustained academic contributions to fortify the evidence-based policy foundation in Indonesia.

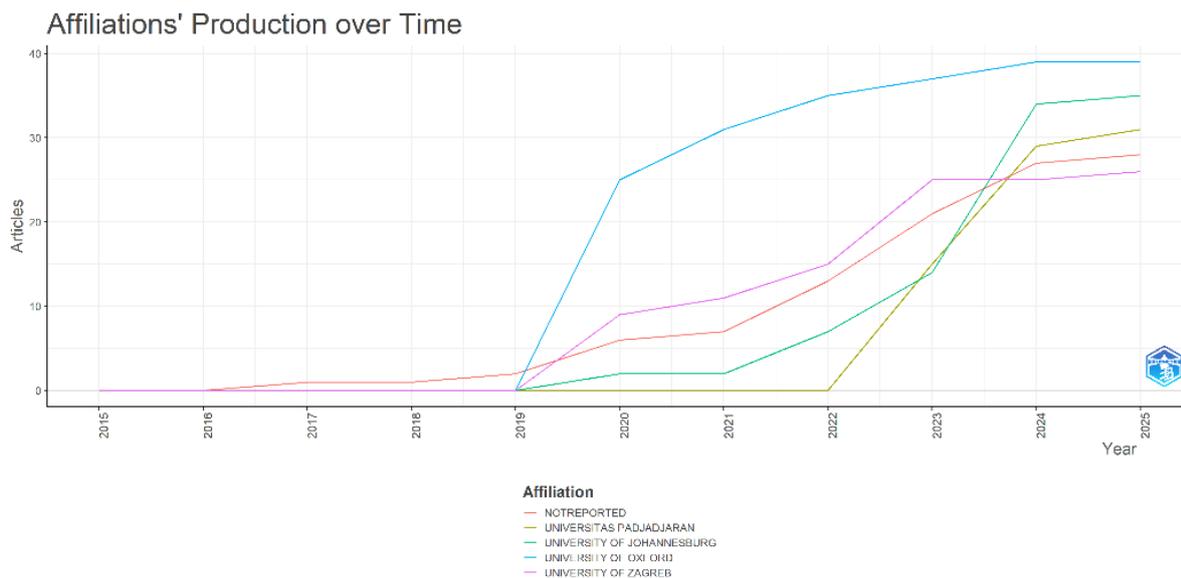


Figure 5. Data Affiliation's Production over Time

Source: RStudio (2025)

Figure 5. A close examination of the "Affiliations' Production over Time" graph, as analyzed through RStudio, reveals a substantial increase in the number of scientific publications related to digital transformation from 2020 to 2025, particularly from prominent institutions such as the University of Oxford, which demonstrated the most significant growth with a total of more than 35 articles in 2025. The University of Zagreb and the University of Johannesburg also demonstrate a consistent upward trend, suggesting the active engagement of global higher education institutions in research on digitalization. Concurrently, the contribution from Padjadjaran University commenced a marked increase in 2022, exhibiting a consistent growth trajectory that culminated in nearly 30 publications by 2025. This development underscores the strategic importance of Indonesian universities in propelling research endeavors related to digital transformation. The NOTREPORTED category also exhibits a relatively high number of publications, suggesting that there is still incomplete documentation of affiliation data in the database. This trend suggests that cross-border academic collaboration and enhanced research capacity at local institutions are pivotal in strengthening digital transformation, particularly in supporting public services and technology-driven economic growth.

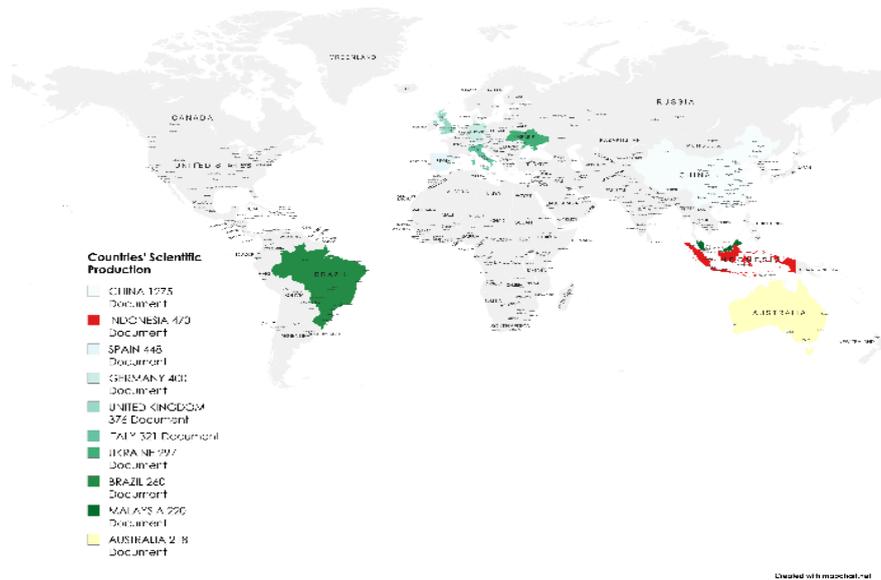


Figure 6. Data Countries' Scientific Production

(Source: RStudio 2025)

Figure 6. According to the "Countries' Scientific Production" table, which was obtained from a bibliometric analysis, China has the highest ranking in terms of scientific contributions related to digital transformation, with a total of 1,275 publications. Indonesia has emerged as a prominent contributor to the discourse and evolution of digital transformation, particularly within the domains of public services and economic activities. This assertion is substantiated by its second-place ranking in terms of the number of publications, which stands at 470. Other countries, including Spain (448), Germany (400), and the UK (376), also demonstrate high scientific productivity, reflecting a global focus on the issue of digitalization. The preponderance of Indonesian entities within the uppermost tier of developing countries signifies that the national government and academic institutions have demonstrated a concerted commitment to the integration of digital technology within government systems and economic development. This data underscores the pressing need for the formulation of strategic policies and the promotion of international collaboration to foster inclusive and sustainable digital governance.



Figure 7. WordCloud

(Source: RStudio 2025)

Figure 7. A review of the WordCloud table reveals that the most frequently occurring term in the literature is digital transformation, with a frequency of 1,313, thus confirming the dominance of this topic in recent scientific discourse. The subsequent aspects of this framework are digitization (345), innovation (303), and sustainability (296). This sequence suggests that the issue of digital transformation encompasses not only technological dimensions but also closely related aspects of innovation and sustainability. A notable aspect of the report is the frequency with which the term "China" appears, with the country being mentioned 220 times. This observation underscores the pivotal role that China plays in the broader context of global digital transformation. Moreover, digitalization, sustainable development, and the ongoing global health crisis known as the Coronavirus Disease 2019 (COVID-19) have emerged as prominent issues, underscoring their pertinence to the contemporary dynamics of digital transformation. The themes of higher education and artificial intelligence underscore the pivotal role of the education sector and advanced technology in facilitating a sustainable digital transformation process.



Figure 8. Data TreeMap

(Source: RStudi 2025)

Figure 8. Digital transformation is the most prevalent topic in the literature, with a total of 1,313 documents or 23% of the total. This finding suggests that researchers are paying significant attention to technological change in various sectors. A plethora of subjects have been the subject of considerable discussion, including, but not limited to, digitization (345 documents, 6%), innovation (303 documents, 5%), sustainability (296 documents, 5%), and China (220 documents, 4%). These subjects, when examined in the context of geographical location and sustainability, serve to underscore the significance of these two dimensions in the broader landscape of digital transformation. Furthermore, themes such as the ongoing global health crisis, higher education, and artificial intelligence have emerged as prominent subjects, underscoring the interconnection between pandemics, higher education, and technological advancements in the broader context of digital transformation. The range of subjects

addressed indicates that the issue of digitalization is not solely technical, but is also intricately linked to social, economic, and public policy dimensions.

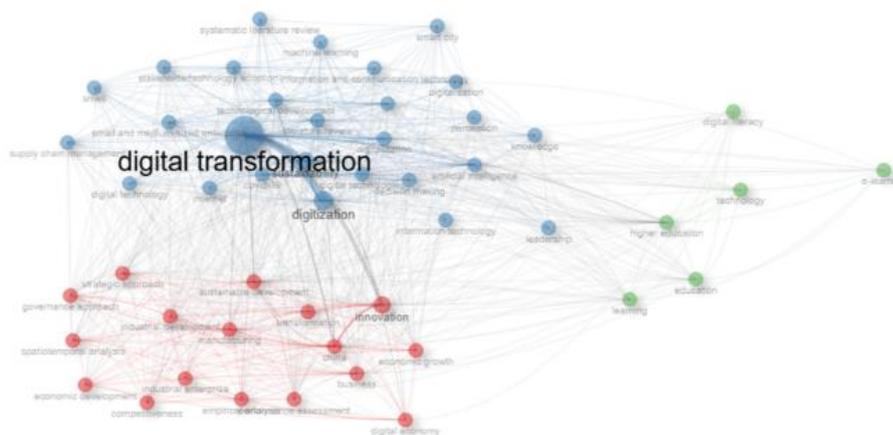


Figure 9. Co-occurrence

Source: Network RStudio (2025)

Figure 9. A close examination of the visualization of the keyword network reveals that digital transformation emerges as the most prominent center. This finding suggests that this topic is a dominant focus in the literature. These keywords are closely related to digitization, innovation, and a number of other concepts, which fall into three different color clusters: blue, red, and green. The blue cluster places significant emphasis on technological and systems-related aspects, including artificial intelligence, information technology, and machine learning. In contrast, the red cluster focuses on economic and developmental aspects, such as innovation, economic growth, and business. Concurrently, the green cluster signifies the association with the education sector through terminology such as higher education, education, and e-learning.

Discussion

The findings suggest that digital transformation has evolved into a structural governance paradigm rather than a mere technological upgrade. The dominance of innovation- and sustainability-related keywords indicates that governments increasingly view digital transformation as a strategic instrument to improve public value creation and economic resilience (Ferreira & Santos, 2025). In this context, digital public services function as enablers of economic activities by reducing administrative burdens, lowering transaction costs, and expanding access to markets, particularly for MSMEs and digital entrepreneurs. This network underscores the notion that digital transformation is not merely a technological phenomenon; it also intersects with the realms of economic innovation and human capacity development, particularly within the context of education (Patwari et al., 2024). A close examination of the visualization results from RStudio about digital transformation reveals that the term "digital transformation" predominates in the frequency and interconnectedness of concepts within the analyzed topic maps Indonesia (Joshi et al., 2025). This observation underscores the significance of digital transformation as a pivotal subject in numerous research and policy discourses, particularly within the context of Indonesia.

In the context of public services for economic activities, the visualization also demonstrates the close relationship between digital transformation and other terms such as digitization, innovation, sustainability, and public service, indicating that digital transformation is not only related to technology adoption but also encourages systemic innovation in governance. The Indonesian government plays a strategic role in driving this transformation process through policies on the digitization of public administration, application-based services, and information systems that facilitate

access and efficiency of economic services (Liu et al., 2019). An analysis of data from Scopus from 2015-2025, conducted using the RStudio tool, also reveals thematic clustering, indicating that the issue of digitalization has been integrated into various aspects, such as education, artificial intelligence, and economic growth (Aminullah et al., 2024).. This, in turn, strengthens the role of the government as the primary facilitator in realizing an inclusive and productive digital ecosystem.

In Indonesia, the strong presence of digital transformation research reflects the government's central role as a catalyst in public service digitalization. Initiatives such as electronic licensing systems, digital population services, and application-based administrative platforms demonstrate how the state actively shapes digital ecosystems that support economic participation. These initiatives align with governance theories that emphasize the state's role in coordinating innovation, setting regulatory frameworks, and facilitating inclusive development (Chen et al., 2025). However, the findings also reveal persistent challenges. Despite rapid digital expansion, issues related to uneven infrastructure development, limited digital literacy, and rigid bureaucratic procedures continue to constrain the effectiveness of digital public services. This indicates that digital transformation is not automatically transformative; its success depends on institutional adaptability, governance capacity, and human resource readiness (Jonathan et al., 2022). The bibliometric clusters related to education and human capital underscore the importance of capacity-building as a prerequisite for sustainable digital governance.

The integration of bibliometric evidence with the Indonesian context reinforces the argument that government-led digital transformation can generate tangible economic benefits when supported by coherent policies and institutional coordination. Digital transformation enhances not only efficiency but also inclusivity by enabling broader participation in economic activities (Diaz-Castillo et al., 2025). Nevertheless, without addressing governance and capability gaps, digital initiatives risk reinforcing existing inequalities rather than alleviating them. Overall, this discussion positions digital transformation as a multidimensional governance process that intersects technology, public administration, and economic development (Ouboumlik et al., 2025). The Indonesian case demonstrates that while digital transformation offers significant opportunities for improving public services and stimulating economic growth, its long-term success requires continuous policy refinement, cross-sector collaboration, and sustained investment in digital infrastructure and human capital.

D. CONCLUSION AND RECOMMENDATION

Conclusion

Digitalization is a foundational change that is transforming the manner in which governments deliver public services and driving the growth of the digital economy. Digital transformation is imperative for economic growth and competitiveness. The Indonesian government plays a pivotal role in catalyzing this transformation process through the implementation of digital public administration policies, mobile application-based services, and information systems that enhance access and efficiency of economic services. The present study demonstrates that the theme of digital transformation is highly relevant and continues to proliferate within the scientific literature. This phenomenon encompasses not only the adoption of technological innovations but also profound structural changes in the manner in which governments deliver services to the public. The study also underscores the integration of the issue of digitalization into various domains, including education, artificial intelligence, and economic growth. Consequently, this reinforces the government's role as a pivotal facilitator in establishing an inclusive and productive digital ecosystem. A bibliometric analysis of Scopus data from 2015 to 2025, processed through RStudio, reveals a significant upward trend in scientific publications on "Digital Transformation."

A comprehensive analysis of 2,904 documents from 824 sources reveals an annual growth rate of 52.34%, underscoring the significance and proliferation of this issue within the scientific literature. The international collaboration rate of 21.97% further substantiates the prevailing trend of cross-country collaboration on this subject. The journal *Sustainability* (Switzerland) is the most prominent source, and a diversity of sources is reflected, reflecting a multidisciplinary approach to the study of digital transformation. China has the highest scholarly contribution, with 1,275 publications, followed by Indonesia in second place with 470 publications. This demonstrates Indonesia's commitment to digital technology integration. The most frequently occurring keyword is "digital transformation" itself, followed by "digitalization," "innovation," and "sustainability." These results indicate that digital

transformation encompasses not only technological dimensions but also closely related aspects of innovation and sustainability. The keyword cluster analysis further demonstrates that digital transformation is not merely a technological phenomenon; it also intersects with the realms of economic innovation and human capacity development, particularly in the context of education.

These findings underscore the necessity of a cross-sectoral approach for a comprehensive understanding of the dynamics of digital transformation. Despite the presence of considerable challenges, including the absence of adequate infrastructure, overly rigid SOPs, limited digital literacy, and inadequate infrastructure, the digital transformation in Indonesia's public sector persists. Addressing issues related to infrastructure, digital literacy, and governance is critical to the successful implementation of digital initiatives. Subsequent research endeavors could concentrate on meticulous case studies of particular triumphs and setbacks in digital policy implementation across diverse regions of Indonesia, incorporating cultural and social factors. Furthermore, additional research could investigate the long-term ramifications of digital transformation on particular economic groups, such as MSMEs and digital startups. Such an investigation would examine how government policies can more effectively promote the inclusion of these entities within the digital ecosystem.

Recommendation

Based on the research findings and discussion, several policy-oriented recommendations are proposed to strengthen the implementation of digital transformation in Indonesia's public sector and enhance its contribution to economic activities. First, the Indonesian government should prioritize equitable digital infrastructure development across regions to reduce disparities in access to digital public services. While digital platforms have expanded rapidly, uneven infrastructure remains a critical barrier, particularly in peripheral and rural areas. Targeted investments in broadband connectivity and public digital facilities are essential to ensure that digital transformation benefits all economic actors, including MSMEs operating outside major urban centers. Second, public sector institutions should reform overly rigid administrative procedures and standard operating procedures (SOPs) that hinder the flexibility of digital service implementation. Digital transformation requires adaptive governance mechanisms that allow experimentation, continuous improvement, and user-centered service design. Simplifying bureaucratic processes and integrating digital workflows can significantly improve service efficiency and responsiveness to economic needs.

Third, enhancing digital literacy and institutional capacity must become a central component of digital governance strategies. Continuous training programs for civil servants and digital literacy initiatives for citizens and business actors are crucial to maximizing the utilization of digital public services. Strengthening human capital will ensure that technological investments translate into tangible improvements in service quality and economic participation. Fourth, the government should foster stronger cross-sector collaboration among public institutions, the private sector, academia, and civil society. Such collaboration can accelerate innovation, improve service interoperability, and support the development of a more resilient digital ecosystem. Partnerships with digital startups and technology providers can also enhance the relevance of public digital services to evolving economic activities. Finally, evidence-based policymaking should be reinforced through the systematic use of data and research, including bibliometric and policy analysis, to guide digital transformation initiatives. Continuous monitoring and evaluation mechanisms are necessary to assess the socio-economic impacts of digital public services and ensure alignment with long-term development goals. Strengthening international collaboration can further support knowledge exchange and policy learning, enabling Indonesia to refine its digital governance framework in line with global best practices.

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