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FACTORS RELATED TO DIGITAL TRANSFORMATION IN LOCAL GOVERNMENT: A SCOPING REVIEW

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ABSTRACT. This study examines factors shaping digital transformation in local government and the mechanisms through which these factors influence implementation outcomes. Using a scoping review design, the study maps recent empirical and conceptual literature to capture the breadth and diversity of evidence. A systematic search was conducted in Scopus, Springer, and EBSCOhost using the keywords "digital transformation" AND "local government", limited to English-language publications published between 2021 and 2025. The search identified 246 records, of which 22 studies met the inclusion criteria and were included in the final analysis. Extracted data were synthesized using a multi-level analytical framework encompassing individual, organizational, and environmental dimensions. The review identifies nine factors frequently discussed as shaping digital transformation in local government: digital capabilities and literacy, readiness for change, organizational capacity, the role of public managers and leadership, organizational culture and values, private sector demands, public expectations, regulatory and political conditions, and broader external conditions. The literature also highlights recurring barriers, including limited digital infrastructure and technical expertise, budget constraints, bureaucratic resistance to change, weak political support, insufficient change-management capability, rigid regulatory frameworks, and complex legacy systems. The findings indicate that digital transformation in local government is not driven by technology alone, but by the interaction of human capabilities, organizational arrangements, leadership, and external stakeholder pressures. Overall, this review underscores the importance of a holistic and integrated approach that strengthens human resources, adaptive governance, and stakeholder coordination to ensure effective, inclusive, and sustainable digital transformation, particularly in decentralized and resource-constrained contexts.

Keywords: Digital government; Digital transformation; GovTech; Interoperability; Local government

ABSTRAK. Penelitian ini bertujuan mengkaji faktor-faktor yang memengaruhi transformasi digital pada pemerintah daerah serta mekanisme bagaimana faktor-faktor tersebut membentuk keberhasilan implementasinya. Penelitian menggunakan desain scoping review untuk memetakan dan mensintesis literatur empiris dan konseptual terkini secara sistematis. Pencarian literatur dilakukan pada basis data Scopus, Springer, dan EBSCOhost dengan kata kunci "digital transformation" dan "local government", dibatasi pada publikasi berbahasa Inggris periode 2021–2025. Pencarian menghasilkan 246 artikel, dan setelah proses seleksi sesuai kriteria inklusi, sebanyak 22 studi dianalisis lebih lanjut. Data yang diekstraksi disintesis menggunakan kerangka multi-level yang mencakup dimensi individu, organisasi, dan lingkungan. Hasil telaah menunjukkan sembilan faktor yang sering dibahas sebagai penentu transformasi digital pemerintah daerah, yaitu kapabilitas dan literasi digital, kesiapan terhadap perubahan, kapasitas organisasi, peran manajer publik dan kepemimpinan, budaya dan nilai organisasi, tuntutan sektor swasta, ekspektasi publik, kondisi regulasi dan politik, serta kondisi eksternal yang lebih luas. Selain itu, teridentifikasi hambatan utama berupa keterbatasan infrastruktur dan keahlian teknis, keterbatasan anggaran, resistensi birokrasi terhadap perubahan, lemahnya dukungan politik, rendahnya kapasitas manajemen perubahan, regulasi yang kaku, serta kompleksitas sistem lama (legacy systems). Temuan ini menegaskan bahwa transformasi digital di pemerintah daerah tidak hanya ditentukan oleh adopsi teknologi, tetapi juga oleh interaksi antara kapasitas SDM, tata kelola organisasi, kepemimpinan, dan tekanan pemangku kepentingan eksternal. Karena itu, diperlukan pendekatan holistik dan terintegrasi untuk memperkuat SDM, tata kelola adaptif, dan koordinasi pemangku kepentingan agar transformasi digital pemerintah daerah berjalan efektif, inklusif, dan berkelanjutan, khususnya dalam konteks desentralisasi dan keterbatasan sumber daya.

Kata kunci: GovTech; Interoperabilitas; Pemerintah daerah; Pemerintahan digital; Transformasi digital

INTRODUCTION

The United Nations recognizes digital transformation as a key catalyst for achieving the SDGs, with digital technology directly supporting 70% of the 169 SDG targets through efficiency, inclusion, and innovation. The ITU-UNDP SDG Digital Acceleration Agenda report highlights 34 specific digital solutions for each SDG, emphasizing universal connectivity and data-driven decision-making. Digital technologies such as AI, IoT, big data, and cloud computing have the potential to accelerate progress on all 17 SDGs, including poverty eradication, health, education, and climate action. The SDG Digital Acceleration Agenda emphasizes inclusivity so that digital transformation "leaves no one behind," addressing the 2.6 billion people who are offline globally (United Nations Development Programme, & International Telecommunication Union, 2023).

The 2025 Sustainable Development Goals Report identifies digital transformation as one of six

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key priorities for advancing the SDGs, alongside food systems and energy access. The UNCTAD Digital Economy Report 2024 highlights the costs of achieving the SDGs through digitalization, including universal broadband connectivity and digital financial inclusion, even though the digital divide hinders developing countries. UNESCO promotes ethical digital transformation with the Internet Universality Indicators (ROAM: Rights, Openness, Access, Multi-stakeholder) to ensure human rights and digital literacy (United Nations, 2025).

Global digital transformation contributes significantly to accelerating the SDGs by directly supporting 70% of the 169 targets through innovations such as AI, 5G, and big data, although disparities in access still hinder equitable progress. UN reports such as the SDG Digital Acceleration Agenda and the 2024 E-Government Survey highlight 34 digital solutions that have been implemented in various countries to accelerate the 2030 agenda (United Nations, 2024).

SDG Cities and ICLEI (Local Governments for Sustainability) promote digitalization for urban governance, reducing administrative burdens and increasing transparency through e-governance. The SDG Digital Acceleration Agenda (ITU-UNDP) shows that digital leaders are surpassing SDG progress, with cities creating data interoperability so that "no one is left behind." The World Smart Cities Outlook 2024 uses technology to serve citizens, not the other way around (United Nations Development Programme, & International Telecommunication Union, 2023).

Low- and middle-income (LMIC) countries face significant challenges in leveraging digital transformation for the achievement of the SDGs due to persistent digital divides, weak infrastructure, and limited digital literacy. Although some "digital leaders" within this group are advancing more rapidly, disparities in access and capacity remain substantial. Inclusive strategies such as public digital infrastructure and city-led initiatives have shown potential in improving service access and reducing inequalities (Elmassah & Mohieldin, 2020).

In Indonesia, this challenge is particularly pronounced because local governments are central to public service delivery within a decentralized governance system, while national digital government reforms must be implemented across highly diverse local contexts. Despite growing policy emphasis on digital government, the pace and quality of digital transformation across provinces, districts, and municipalities remain uneven. Differences in infrastructure readiness, human resource capacity, leadership commitment, institutional coordination, and regulatory flexibility continue to constrain effective implementation at the local level. These conditions illustrate where the research problem arises: digital transformation is increasingly mandated and necessary, yet many local governments struggle to implement and sustain it in practice.

The Digital transformation in local government is an area that has been under-explored. In fact, local governments have daily direct contact with citizens, while the adoption of digital technology has been quite slow (Bousdekis, 2020). Digital transformation is not merely a process of digitizing existing systems, but rather a fundamental and holistic change in the way governments operate, serve the public, and carry out their functions (Azevedo, 2025; Bousdekis, 2020).

Digital transformation in local government represents a profound sociotechnological shift that extends beyond internal reorganization to a redefinition of the political relationship between the state and its citizens (Azevedo, 2025). Unlike traditional e-government, which focuses on transactional interactions, this transformation facilitates the interoperability required for a 'smart state' (Bousdekis, 2020). Crucially, this evolution is not merely technical but deeply political, as it reshapes participatory governance by enabling more direct civic engagement. To fulfill the promise of a truly inclusive smart state, this process must be guided by the 'leave no one behind' principle, ensuring that digital-first policies do not disenfranchise marginalized groups or exacerbate existing social inequalities.

In the context of local government, digital transformation is driven by various external and internal factors, including technological changes in the environment, demands from private sector organizations for the government to adapt, and increasing citizen expectations regarding the quality and accessibility of public services (Bakhov, 2025). This process is part of a broader government reform agenda, which is often influenced by central and national reform policies. The literature shows that digital transformation has become one of the most important trends in modern public administration, with the potential to fundamentally change the way local governments deliver services to the community.

Digital transformation in local government has had a significant impact on both operational aspects and public services. First, from an operational efficiency perspective, digital transformation has enabled local governments to automate repetitive processes, reduce administrative burdens, and

increase productivity. Research shows that automation and digital service delivery have achieved substantial efficiency gains, with unit-cost reductions reaching 39.9% for municipal administration and 73.9% for citizens and businesses (Gonçalves & Maggion, 2022).

Studies have also documented productivity improvements of up to 282% in transaction processing through digitalized workflows (Prachumrasee et al., 2024). Furthermore, digital transformation facilitates more in-depth data analysis, enabling local governments to make more accurate and targeted evidence-based decisions, with some municipalities reporting increases in digital revenue collection from 0.2% to 12.3% of total municipal revenue (Rivadeneira-Barreiro, 2023).

Second, in terms of public service quality, digital transformation improves the accessibility, quality, and responsiveness of government services (Azevedo, 2025). Digital solutions expand the reach of public services without being limited by time or geographical constraints, reduce the administrative burden on citizens, and increase citizens' autonomy in accessing government information and services. Digital transformation also increases transparency and accountability through the dissemination of reliable information, and opens up opportunities for broader public participation through digital platforms that facilitate two-way dialogue between the government and citizens.

Third, digital transformation has a strategic impact on sustainable development and local government resilience. The literature shows that digital transformation significantly improves a nation's economic sustainability (Bakhov, 2025). Digital technology enables local governments to address complex environmental challenges, respond to climate change more adaptively, and integrate sustainability principles into government operations. More than half of government leaders identify climate change as a key driver for the adoption of digital technology in their government operations, demonstrating the close connection between digital transformation and environmental risk management.

However, digital transformation also brings serious challenges and risks. The implementation of digital technology in government creates complex ethical dilemmas, including issues of data privacy, algorithmic bias, cybersecurity, and the potential for digital exclusion of communities that are underserved by digital infrastructure (Lanne et al., 2025). Digital transformation also requires substantial resource investments, organizational culture change, and significant human resource competency development, which local governments with limited budgets cannot always afford.

Research on the factors influencing digital transformation shows that the success of digital transformation in local government is influenced by multi-level mechanisms. Building on a multi-level perspective, this study examines factors that are frequently discussed in the literature as shaping digital transformation in local government, encompassing individual, organizational, and environmental dimensions.

Prior studies suggest that the success of digital transformation in local government is shaped by multi-level mechanisms spanning individual, organizational, and environmental dimensions. At the individual level, digital capabilities and literacy such as mindset, work skills, and technology acceptance are frequently discussed as enabling conditions that influence the quality and sustainability of digital services.

At the organizational level, the literature highlights the importance of organizational capacity, including human resource readiness, IT infrastructure, digital leadership, and organizational agility, which together determine a local government's ability to invest in technology, train staff, and redesign processes. Leadership and the role of public managers are commonly emphasized as prerequisites for setting a clear direction, mobilizing resources, and creating an environment that supports innovation and learning (Branderhorst & Ruijer, 2025; Gasco-Hernandez et al., 2022; Nielsen, 2024).

In addition, studies frequently note that digital transformation requires shifts in organizational culture, routines, and values toward collaboration, experimentation, and citizen-centric service delivery. At the environmental level, external pressures such as private sector demands, rising public expectations, regulatory and political conditions, and broader contextual factors are also reported as shaping implementation trajectories (Weißmüller, 2023; Zhou et al., 2024).

Alongside these enabling factors, the literature consistently reports barriers including limited digital infrastructure and technical expertise, budget constraints, bureaucratic resistance to change, weak political support, insufficient change-management capability, rigid regulatory frameworks, and challenges integrating legacy systems (Bennett & Meers, 2025; Kuhlmann et al., 2023). Overall, existing studies indicate that local governments adopt heterogeneous approaches and achieve

varying levels of success, reflecting differences in local contexts and in how digital transformation is defined and assessed (Bakhov, 2025).

Literature on digital transformation in local government is still limited and fragmented. Although academic interest in this topic continues to grow, research on the factors influencing digital transformation is still scarce and has yet to comprehensively integrate a multi-level perspective. Previous studies tend to focus on a single dimension, whether it be technology, organization, or the external environment, but few have integrated all three dimensions into a cohesive analytical model (Zhou et al., 2024). In addition, the term "digital transformation" is still ambiguous and is not used consistently, even among experts, making it difficult to compare studies and generalize findings (Hernandez, 2024).

Furthermore, although stakeholder interactions are mentioned in parts of the literature, they are often treated implicitly (e.g., as "public expectations" or "private sector demands") and rarely synthesized as a relational implementation mechanism in the local government context. This scoping review therefore maps how different stakeholder relationships are described and how they intersect with individual, organizational, and environmental factors.

This study aims to fill this gap through a comprehensive preliminary review of factors related to digital transformation in local government. Specifically, this study seeks to: (1) identify and synthesize the main factors that influence digital transformation in local government from a multi-level perspective, (2) map the types of research, countries, and levels of local government where the research was conducted, (3) understand how individual, organizational, and environmental dimensions interact in influencing the success of digital transformation, and (4) identify practical implications and policy recommendations to improve the success of digital transformation in local government. Thus, this research is expected to make an important contribution to the development of theory on digital transformation in the context of local government, while also providing practical insights for policymakers and local government practitioners in directing and managing their digital transformation processes more effectively and sustainably.

METHOD

This study uses a scoping review to map and synthesize evidence on factors related to digital transformation in local government. A scoping review aims to summarize the scope and nature of literature in a field, clarify working definitions, and uncover research gaps (Smith et al, 2022). The review follows the Arksey and O'Malley framework (2005) through five stages: identifying the research questions, identifying relevant studies, selecting studies, data charting (extraction), and collating and reporting results. Reporting adheres to PRISMA-ScR, and the selection process is summarized in a PRISMA flow diagram (Figure 1).

Search Strategy and Information Sources

A systematic literature search was conducted across three electronic databases Scopus, Springer, and EBSCOhost using the keywords "digital transformation" AND "local government". Searches were limited to English-language publications and the period 2021–2025 where applicable, to ensure the inclusion of recent and relevant studies. The search was applied to titles, abstracts, and/or keywords depending on each database's available search fields. The database search identified 246 records in total (Scopus = 77; EBSCOhost = 34; Springer = 135). Two authors (HS and MR) independently conducted the searches and exported all identified records. The retrieved records were then combined into a single dataset and checked for duplicates prior to screening. No duplicate records remained after export and manual verification across the three databases. Subsequently, HS and MR independently screened titles and abstracts to assess relevance to digital transformation in local government, in accordance with the PRISMA-ScR process (Figure 1).

Study Selection

Following the PRISMA-ScR process, 246 records were screened at the title and abstract stage, and 224 records were excluded due to irrelevance to local government digital transformation or insufficient focus on determinants/barriers. Twenty-two (22) reports were sought for retrieval, and all full texts were successfully obtained (reports not retrieved = 0). Full-text eligibility assessment was conducted for 22 reports, and all met the inclusion criteria. Therefore, 22 studies were included in the final review (n = 22). Any screening disagreements between HS and MR were resolved through discussion and consensus.

Eligibility Criteria

Studies were included if they (1) were full-text accessible, (2) were written in English, (3) were published between 2021 and 2025, (4) addressed digital transformation in local government settings

(e.g.,municipalities/cities/counties/regional governments), and (5) reported determinants/enablers, mechanisms, or barriers related to implementation and/or outcomes. Studies were excluded if they were non-English, lacked full-text access, focused only on national-level government, or were purely technical system development papers without organizational/ governance relevance.

Extraction and Analysis

Data relevant to the review objectives were extracted from each included study, including study characteristics, context of digital transformation, and all reported factors and barriers affecting implementation. Extracted information was analytically organized using a multi-level framework encompassing individual, organizational, and environmental dimensions. Through content analysis, conceptually similar factors were grouped and synthesized into higher-order themes. Screening and extraction were conducted independently by two authors, with disagreements resolved through discussion.

RESULT AND DISCUSSION

A total of 246 articles were evaluated based on their titles and abstracts, and 224 articles that did not meet the criteria were excluded. Thus, 22 full-text articles were evaluated, all of which were retrieved because full access was available. Finally, the remaining 22 articles were included in the analysis.

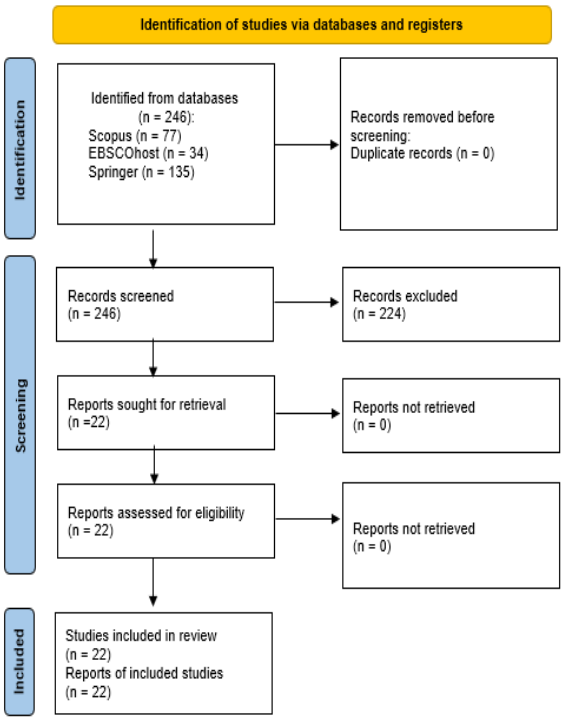

Figure 1. Study selection process

The review findings reveal three categories of factors that determine the success of digital transformation in local government, namely: 1) Individual, 2) Organization, 3) Environment. Individual factors include digital skills and literacy; readiness to accept change. Organizational factors include organizational capacity; the role of public managers and leadership; organizational culture, habits, and values that must change in line with digital transformation. Environmental factors include private sector demands; community expectations; regulations and political conditions that influence policy and technology implementation; external conditions.

The findings of the review of individual factors that determine the success of digital transformation in local government show that digital capabilities and literacy are the commonly discussed factors, followed by readiness to accept change. The success of digital transformation in local government is largely determined by the capabilities of human resources and the level of digital literacy that shapes the way bureaucrats plan, manage, and utilize technology in the public service process (Enaifoghe, 2025). The mechanism works through changes in mindset, work skills, and technology acceptance, which then influence the quality of implementation and application of digital services by the community (Wahyudin et al., 2024). Employees with higher digital capabilities tend to be champions of innovation, quicker to adopt new systems, and become references for their colleagues, thereby accelerating the diffusion of innovation in the organization (Stefano et al., 2024).

Readiness to accept change in the public sector includes employees' belief that digital change is necessary, beneficial, and feasible with available resources (commitment to change and change effectiveness) (Hameed et al., 2017). Studies on the readiness of government employees in digital transformation in the workplace and its impact on productivity found that that employees are basically ready and willing to accept digital change, but the effectiveness of technology and its impact on well-being/performance can still be improved through Human Resources interventions and work design (Jesus & Santiago, 2024).

Leadership and organizational capacity were among the most frequently reported factors influencing digital transformation in local government. Organizational capacity factors such as human resource readiness, IT infrastructure, digital leadership, and agility are indeed crucial in local

digital government transformation, with the main obstacles being cultural resistance and unequal access. Empirical studies show that agile leadership and IT infrastructure increase service efficiency by 50-70% despite high bureaucratic resistance (Kemper, 2024).

Organizational capacity influences digital transformation through the mechanism of resource availability. Sufficient financial resources enable local governments to purchase the necessary technology, train staff, and develop sophisticated information systems. Skilled human resources enable the proper implementation of technology and effective system management (Kuhlmann et al., 2023). However, the impact of resource availability is not deterministic. Organizations with abundant resources can still fail in digital transformation if those resources are not managed properly or if there is no clear vision of how they will be used. Conversely, organizations with limited resources can often achieve remarkable results through smart management, innovation, and collaboration (Bennett & Meers, 2025).

Other dominant organizational factors are the role of public managers and leadership in the success of digital transformation in local government. The review identifies visionary leadership and commitment from the executive level as very important prerequisites (Gasco-hernandez et al., 2022). Leaders who understand the strategic value of digital transformation and are able to effectively communicate this vision to the entire organization can create the necessary momentum and support. Effective digital leadership requires not only a technical understanding of technology, but also the ability to consider the ethical, organizational, and social implications of technology adoption(Branderhorst & Ruijer, 2025). Visionary leadership influences digital transformation through several channels. First, leaders who understand the importance of digital transformation can communicate a strong and compelling vision of the future of digital local government (Nielsen, 2024). This vision creates a narrative that gives meaning and purpose to digital transformation efforts, which in turn motivates and inspires the organization to accept and support change (Hernandez, 2024). Second, visionary leaders can allocate organizational resources toward digital transformation initiatives, ensuring that digital transformation receives the priority it deserves among competing demands for resource allocation. Third, leaders can create an organizational environment that supports innovation and learning, where failure is seen as a learning opportunity rather than something to be avoided (Branderhorst & Ruijer, 2025).

Organizational culture, habits, and values that must change along with digital transformation are among the key factors in the success of digital transformation in local government. Digital transformation can be understood not merely as the implementation of systems, but as a change in the way of thinking, values, and organizational artifacts (symbols, structures, processes) in order to align with digital logic (Cyfert, 2025). The core digital values emphasized are adaptability and innovation; trust, psychological security, and engagement; focus on user experience (customers/citizens) (Papadonikolaki & Morgan, 2025; Plekhanov et al., 2023; Verdegem & Verleye, 2009).

The mechanism for changing organizational culture, habits, and values in digital transformation in local government occurs through a series of steps: digital leadership and strategy, change management and capacity building, shifting work routines, and promoting new values (innovative, collaborative, and citizen-centric) (Amaliah et al., 2023; Cao et al., 2025; Haug et al., 2024; Yang et al., 2024).

The findings of the review of environmental factors show that citizens' increasing expectations regarding the quality of digital services are also a significant driving factor. Citizens who are accustomed to easily accessible digital services in the private sector expect the government to provide a similar experience. Research using the Technology-Organization-Environment (TOE) framework identifies that citizen expectations and higher pressure from the government are the most important environmental factors in driving digital transformation (Xiao et al., 2022). Citizen expectations for digital services create pressure through the mechanisms of customer satisfaction and social legitimacy. When citizens expect high-quality digital services and do not receive them, their satisfaction with the government may decline, which in turn may impact public legitimacy and trust in the government (Zhou et al., 2024). This creates incentives for local governments to improve the quality of their digital services.

In addition, citizens' expectations also create pressure through social learning and imitation mechanisms. When citizens see that other local governments provide better digital services, they expect their local government to do the same (Madan & Ashok, 2025). This creates competition between regions in terms of the quality of digital services.

The findings of the review of demands from the private sector on local governments in digital transformation include encouragement for

governments to adopt the latest technologies and digital innovations that can improve efficiency, transparency, and quality of public services, as well as adapt to modern business practices that have integrated technology into their operations (Hernandez, 2024). Various forms of demands from the private sector include encouraging local governments to utilize the latest technology; demands for transparency and accountability through e-Government, e-procurement, and digital service tracking systems; expectations for data interoperability and clear regulations on integration systems between local governments and companies (Chen, 2024; Frinaldi et al., 2024; Szedmák et al., 2025).

Regulations and political conditions are part of the environmental context that influences technology adoption. The findings of this environmental context review cover industry, competition, external resources, and regulatory bodies that provide opportunities and constraints such as regulations, capital availability, and market forces that influence innovation and technology implementation (Aristovnik et al., 2025). In addition, external factors such as environmental pressures and legal obligations also have a significant impact on digital transformation (Xiao et al., 2022).

Regulations act as environmental factors that provide limitations and opportunities in the application and implementation of technology. Regulations include rules, standards, policies, and legal obligations that must be complied with by organizations or governments. Regulations can serve as controls that ensure safety and compliance, but they can also be obstacles if they are too rigid or bureaucratic, thereby hindering innovation and the functioning of technology (Aristovnik et al., 2025; Lanne et al., 2025). Appropriate regulations can support digital transformation by providing a clear framework and legitimacy for the application of new technologies (Aristovnik et al., 2025; Filgueiras et al., 2025).

Political conditions play an important role in technology policy and implementation, especially in the context of digital transformation in government. Stable political conditions and support from political leaders are essential for the effective adoption of technology. However, digital transformation is often not a top priority on the political agenda because it is considered a technical issue. Therefore, city managers need to clearly communicate the various interests and options available to politicians so that digitization receives the attention it deserves (Branderhorst & Ruijer, 2025). In addition, a good government image is also an important source of legitimacy and political power in supporting the successful implementation of technology (Zhou et al., 2024).

Regulatory mechanisms and political conditions influence digital transformation in several ways. Regulations provide a legal framework and rules governing the use of technology, ensuring the security, reliability, and interoperability of digital systems. However, overly strict regulations can hinder innovation and slow down digital transformation (Azevedo, 2025; Zhou et al., 2024). Meanwhile, political conditions, including political stability and leadership support, are crucial to the success of digital transformation as they influence policy priorities and resource allocation. Interaction between the government and citizens, as well as the government's image, also play a role in improving the performance of digital transformation at the local level (Zhou et al., 2024). Thus, regulations and political conditions shape the external environment that can accelerate or hinder the process of government digitalization.

External conditions in digital transformation include environmental pressures such as technological changes, pressure from the external environment, and external legal obligations that have a significant impact on digital transformation (Xiao et al., 2022). In addition, interaction with various external stakeholders and increased digital literacy among the public are also important factors that accelerate the digital transformation process at the local level (Hernandez, 2024; Xiao et al., 2022; Zhou et al., 2024). Other contextual factors such as the level of economic development, institutional conditions, competition between governments, cross-government learning, and infrastructure development also play a significant role in determining whether digital transformation can run effectively (Zhou et al., 2024).

Implications for Practice and Policy

The implications for practice and policy cover six main areas: (1) implications for central government policy, (2) implications for practice and policy at the local government level, (3) implications for practice at the departmental level, (4) implications for external stakeholders, (5) implications for research and continuous learning. The central government formulates policies covering mandate and incentive policies, financial and technical support, regulation and harmonization, and coordination between levels of government. Local governments prepare practices and policies covering strategic leadership and commitment, organizational capacity building, strengthening collaborative capacity, and designing user-centric and inclusive systems. Implications for

practices at the departmental level include change management and adoption, and optimization of operational processes. Implications for stakeholders include community engagement and partnerships with the private sector.

Implications for future research should use longitudinal research designs that track the development of digital transformation in local governments over time. These designs may include prospective longitudinal studies that track local governments over several years, retrospective case studies that trace the history of digital transformation in specific regions, process tracing and narrative analysis to understand how changes occur and why, and time series analysis to identify temporal patterns in factors and outcomes.

Limitations

This review has significant limitations in four critical dimensions that drastically reduce the generalizability of the findings, particularly in terms of: (1) geography and country representation, (2) databases and search strategies, (3) time frame and year of publication, and (4) digital transformation measurement instruments. The findings of this review are highly reflective of the digital transformation experiences of countries with mature digital infrastructure, abundant financial resources, and strong institutional capacity. The specific contexts and challenges faced by the majority of local governments around the world (in developing countries) with limited infrastructure, budgets, human resources, and significant technological brain drain are underrepresented. The challenges faced by rural local governments (infrastructure gap, talent gap, resource gap) may be underestimated. Policy recommendations developed based on urban experiences may not be suitable for rural contexts.

Important literature on the digital transformation of government in developing countries is overlooked. This review over-represents the perspectives of the Global North and under-represents those of the Global South. Publications in languages other than English are significantly underrepresented.

The findings are highly reflective of current understanding (post-2015). How understanding of digital transformation has evolved over time is less apparent. When interpreting the findings, it is necessary to distinguish between: publications pre-2020: pre-pandemic era, less relevant for 2023-2025; publications 2020-2021: early pandemic, accelerated digitalization; publications post-2021: established pandemic/new normal, most relevant to the current context.

Digital transformation measurement instruments include instrument variation data, instrument specification issues, and lack of validated instruments. Instrument variation data found no consensus on definitions, highly diverse operationalization, mixing of dependent and independent variables. Instrument specification problems found that estimates of digital transformation success may be biased toward the positive (overestimation), biased toward efficiency-focused understanding, ignoring social implications, biased toward a "technology is the solution" mindset, with the majority of publications measuring from a government perspective. The lack of validated instruments was found to be the absence (or very few) of validated instruments to measure digital transformation in government. Most studies developed their own ad-hoc instruments. The majority of instruments did not have psychometric evidence (reliability, validity), and there was potential misfit between the instrument and the context.

CONCLUSION

Research results consistently show that factors related to digital transformation in local government can accelerate or slow down the digitization process. Digital transformation requires a holistic approach between the three levels of individuals, organizations, and the environment, which includes nine key factors: (1) digital capabilities and literacy; (2) readiness to accept change; (3) organizational capacity; (4) the role of public managers and leadership; (5) organizational culture, habits, and values that must change along with digital transformation; (6) private sector demands; (7) public expectations; (8) regulations and political conditions that influence policy and technology implementation; (9) external conditions.

The success of implementation depends on strategic management of organizational capacity, strong leadership support, and responsiveness to external pressures from society and the broader regulatory environment.

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