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Digital Transformation in Public Sector Institutions: A Systematic Literature Review and Comparative Country Analysis

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ABSTRACT

Digital transformation has become a strategic priority for governments seeking to enhance efficiency, service quality, and citizen engagement. Despite growing interest, empirical and conceptual insights remain fragmented. This study aims to systematically synthesize existing research on digital transformation in the public sector and to identify key benefits, challenges, and implementation approaches. Following PRISMA guidelines, a systematic literature review was conducted using reputable academic databases and official government sources. A total of 28 empirical and conceptual studies met the predefined inclusion criteria. The selected studies were analyzed using thematic analysis to extract recurring patterns, governance contexts, and strategic implications. The findings indicate that digital transformation in government yields significant benefits, including improved cost efficiency, enhanced public service delivery, and greater citizen participation. Cross-country evidence from cases such as Singapore, Australia, and South Korea demonstrates that governance structures, institutional capacity, and policy alignment critically influence the design and outcomes of digital initiatives. However, persistent challenges remain, notably data security and privacy risks, limited resources, and resistance to organizational change. Based on the synthesized evidence, this study proposes a Citizen-Centric Adaptive Model that emphasizes iterative development, data-driven decision-making, and participatory engagement. The study concludes that digital transformation represents a strategic opportunity for governments to improve effectiveness and public satisfaction, while offering practical guidance for policymakers seeking to modernize public sector operations.

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1. INTRODUCTION

Information technology has become an integral element of contemporary society, fundamentally reshaping how governments design, deliver, and evaluate public services (Zhu, Ge, & Wang, 2021). In

this evolving environment, digital transformation has emerged as a central concept in public administration, referring to the strategic and systemic use of information and communication technologies (ICT) to improve the effectiveness, quality, and efficiency of public sector operations (Aminah & Saksono, 2021; Danielsen, Flak, & Sæbø, 2022; Viana, 2021). Rather than representing a purely technical shift, digital transformation involves organizational, cultural, and governance changes that redefine relationships between governments, citizens, and other stakeholders. A growing body of scholarship suggests that well-designed digital transformation initiatives can enhance cost efficiency, expand service accessibility, strengthen citizen engagement, and stimulate innovation in public service delivery (Dunleavy et al., 2006; Bovaird & Löffler, 2012). However, these initiatives are frequently constrained by persistent challenges, including concerns over data security and privacy, limited financial and human resources, institutional resistance to change, and uneven digital capabilities within the public workforce (Mountasser & Abdellatif, 2023; Haug, Dan, & Mergel, 2023).

At the international level, several countries—most notably the United States, Australia, Singapore, and South Korea—are often cited as leading examples of digital government reform. These countries have leveraged e-government platforms, big data analytics, and artificial intelligence to modernize public administration and improve public sector performance (West, 2007; United Nations, 2016; Meyerhoff & Jordanoski, 2020; Janssen & van der Voort, 2016; Supriyadi & Asih, 2020). Despite the growing number of such studies, the academic literature on digital transformation in government remains highly fragmented. Much of the existing research focuses on single-country case studies or narrow sectoral applications, limiting the ability to draw broader comparative insights. Consequently, there is a lack of systematic syntheses that integrate findings across national contexts and identify patterns in how different governance systems design, implement, and adapt digital transformation initiatives—particularly in relation to the policy and institutional challenges faced by emerging economies.

Within this broader global context, Indonesia represents a particularly relevant case. The country has articulated an ambitious "Indonesia Digital" vision, supported by a series of national policy instruments, including six strategic directions for digital development (Lumbanraja, 2020) and Presidential Regulation Number 95 of 2018 on the Electronic-Based Government System (Sistem Pemerintahan Berbasis Elektronik—SPBE) (Patrisia & Anwar, 2021). The SPBE framework conceptualizes government administration as a set of integrated processes enabled by ICT to deliver user-oriented and interoperable public services (Afriyani, Muhafidin, & Susanti, 2022). Central to these initiatives is a strong emphasis on digital competence within the public sector, defined as the knowledge, skills, and attitudes required to effectively access, use, create, and share digital resources, as well as to collaborate through digital technologies (Perifanou & Economides, 2019; KR et al., 2023; Mattajang, Nurwulandari, & Hardin, 2022).

Despite these policy commitments, Indonesia continues to face significant implementation challenges. These include limited inter-agency coordination, uneven digital infrastructure across regions, and shortages of digitally competent human resources to design, manage, and sustain digital public services (Firdaus et al., 2021; Hardi & Gohwong, 2020; Setyasih, 2022). Similar difficulties are evident in other national contexts, where governments struggle to translate ambitious digital strategies into effective operational practices (Dobrolyubova, 2021; Plekhanov et al., 2022; Escobar et al., 2023). These persistent gaps, coupled with rapid technological change and rising citizen expectations, highlight the need for a cross-national systematic literature review (SLR) that goes beyond cataloguing benefits and barriers to examine how different governments govern, coordinate, and adapt digital transformation efforts over time.

Responding to this gap, the present study conducts a cross-national SLR of digital transformation in the government sector, synthesizing insights from 28 empirical and conceptual studies encompassing both Indonesia and other country contexts (Hanelt et al., 2021; Novianto, 2023; Latupeirissa et al., 2024). By positioning Indonesia as a primary reference case within a broader comparative framework, this review connects global experiences with the institutional, infrastructural, and human-resource realities of an emerging economy. Building on the synthesized findings, the study proposes a Citizen-Centric Adaptive Model that emphasizes iterative learning, participatory design, and data-informed decision-making. By explicitly foregrounding citizens as co-creators and beneficiaries of digital government, this

model advances existing literature and offers practical guidance for governments seeking inclusive and sustainable digital transformation.

Accordingly, this study addresses the following research question: How do different national governments approach digital transformation in public institutions, and what lessons can be drawn for emerging economies such as Indonesia?

2. METHODS

2.1 Search strategy

Literature searches are carried out on ScienceDirect, equipped with ProQuest and Google Scholar, to capture documents of official institutions (UN, OECD, ministries). Keywords combined with AND/OR logic: "digital transformation", "digital government", e-government, "public sector digit*", "government digit*", "smart city", interoperab*, "identity system*", "data governance", "artificial intelligence", "big data", matched with government/public administration/public service. Range 2005–2025; English or Indonesian. The results are exported (RIS/BibTeX/CSV) and saved for documentation.

2.2 Inclusion–exclusion criteria

Included are studies that (i) examine government institutions (central/regional/city/public institutions), (ii) discuss the digital transformation of the public sector (digital services, interoperability, digital identity, data/AI, security, cloud, smart city), (iii) in the form of reputable journal/proceedings articles or grey literature of official institutions with substantive analysis, (iv) full-text available in the range and languages above. Excluded: editorial/opinion, private sector focus, review without an obvious method, irrelevant to policy output, duplication, or lack of full access.

2.3 Study selection procedure (based on PRISMA)

All records are merged and deduplicated in Zotero/EndNote (automatic and manual checks). Screening is carried out in two stages: a title–abstract stage, followed by a full-text review. The reasons for exclusion in the full review were noted (not the public sector; not the focus of digital transformation; insufficient data/outcomes; editorial/duplication). The results of each stage are summarized in the PRISMA flowchart. The final output totalled 28 studies that were further analyzed. Two reviewers worked independently at both stages (title–abstract and full-text). Inter-rater reliability (IRR) was assessed using Cohen's κ; disagreements were resolved through discussion, with a third reviewer available when consensus was not reached. We adopted "substantial agreement" as the a priori threshold following standard benchmarks. The final inclusion set reflects reviewer consensus.

2.4 Data extraction and analysis

Data is extracted using a simple form containing: metadata (author/year/country/level), design/method, digital transformation domain, governance/coordination, resources & capabilities, outputs (efficiency, quality of service, transparency/accountability, participation/inclusivity, policy impact), and risks/barriers. For synthesis, we used thematic synthesis guided explicitly by Braun & Clarke's six-step framework: (1) familiarization with the corpus; (2) generating initial codes; (3) searching for candidate themes; (4) reviewing themes against coded extracts and the full data; (5) defining and naming themes; and (6) producing the narrative. Coding began deductively from the extraction schema and was iteratively refined inductively via constant comparison across studies and levels of government. Example seed codes included "governance model," "capability gap," and "inclusivity challenge," which were merged/split as patterns stabilized. To enhance transparency, we summarize the final thematic structure in Table 1 and provide codebook excerpts (definitions, examples, and inclusion/exclusion notes).

Table 1. Thematic coding structure (summary)

Theme	Definition / Scope	Sample Codes	Evidence Types	Representative Outcomes
Governance model	Arrangement of mandates, coordination, and operating models (centralized/decentralized/hybrid)	lead agency; interoperability authority; platform governance	policy papers; cross-agency case studies	faster rollout; reduced duplication
Capability/capacity gap	Human, budgetary, process, and data capabilities required to execute DT	digital skills; data stewardship; change management	surveys; skills audits	delivery delays; technical debt
Inclusivity/equity challenge	Access, accessibility, language, disability, and regional gaps	digital divide; citizen literacy; assisted channels	user studies; administrative data	reach to vulnerable groups; complaint rates
Enablers	Conditions that accelerate DT	leadership commitment; funding; standards; legal clarity	comparative cases; reforms	higher adoption; service quality gains
Obstacles/risks	Barriers and threats to DT	cybersecurity; privacy; vendor lock-in; resistance to change	incident reports; audits	service downtime; trust erosion
Key technologies	Core tech used in DT	ID systems; APIs; cloud; AI; big data; IoT	technical docs; pilots	process automation; analytics use
Policy outputs & impacts	Observable effects on public value	efficiency; transparency; participation; accountability	KPIs; evaluations	cost/time savings; satisfaction; uptake

2.5 Methodological quality appraisal

We conducted a descriptive quality appraisal to contextualize the evidence rather than to determine study inclusion. For qualitative studies and systematic reviews, we applied the appropriate Critical Appraisal Skills Programme (CASP) checklists, while mixed-methods studies were assessed using the Mixed Methods Appraisal Tool (MMAT). Two reviewers independently rated each study as having "Low," "Moderate," or "High" concern based on the checklist responses (Yes/Partial/No), with discrepancies resolved through consensus. These quality assessments informed the interpretive weighting within the thematic synthesis and were used in sensitivity analyses—for instance, by identifying themes primarily supported by studies with higher levels of concern. Appraisal forms are available upon request.

2.6 Process reliability

Before starting, both reviewers calibrated criteria via pilot coding on a 10% sample to harmonize inclusion/exclusion judgments and code application. During screening and extraction, each decision is recorded briefly, allowing changes to be easily tracked (in/out and the reason). IRR was monitored at the pilot and main screening phases using Cohen's κ; values indicated at least substantial agreement at each phase. Any residual uncertainties were documented and revisited during synthesis. The study

does not involve human subjects and therefore does not require informed consent. All sources are listed according to the citation rules.

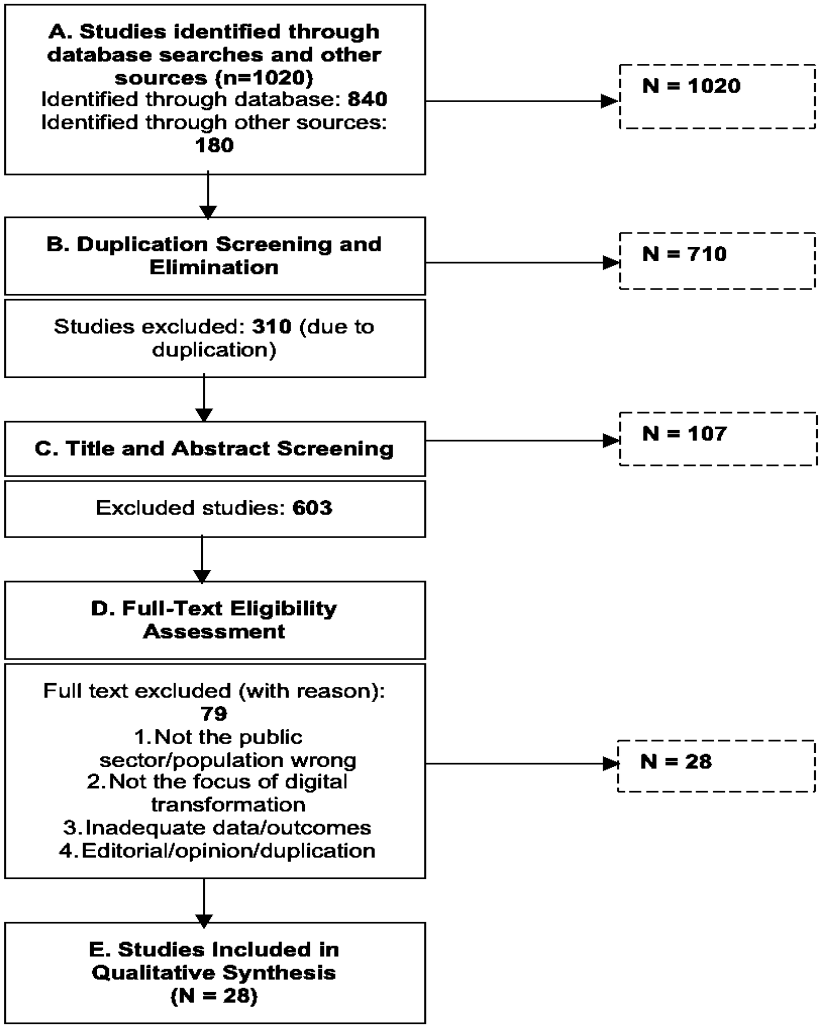

Figure 1. Prisma Flow Diagram

3. FINDINGS AND DISCUSSION

The results of the literature study indicate that the filtered documents contain various terms related to digital transformation in government institutions. Based on the screening of documents that have been carried out, the following data is obtained.

Table 2. Descriptive Summary of Digital Transformation Research in Government and Public Administration

No	Research Title	Writer	Research Results
1	Digital government: Technology and public sector performance	West (2005)	Digital transformation can increase the efficiency and effectiveness of public services, but it is necessary to consider factors such as data security and budget availability.
2	Global perspectives on e-government	West (2007)	Provides an overview of the development of electronic government around the world and the importance of information technology in

No	Research Title	Writer	Research Results
			modern governance. This chapter can be a useful resource for government practitioners and researchers, especially those interested in issues related to electronic government and information technology in government.
3	Understanding Digital Transformation in Government.	Danielsen, F., Flak, L.S., & Sæbø, Ø. (2022)	This research highlights the importance of recognizing the social and technological aspects involved in digital transformation, as well as how concepts such as organizational culture and citizen participation can influence the success of digital transformation in government.
4	Digital transformation in public administration: from e-Government to digital government	Viana, ACA (2021)	The results of his research discuss important concepts related to digital transformation, such as data and analytics, artificial intelligence, and systems integration. He also discussed how new technologies such as the Internet of Things (IoT) and Blockchain can be used in digital governance and highlighted the importance of focusing on user experience and citizen participation in digital governance.
5	Digital transformation, governance and coordination models: A comparative study of Australia, Denmark and the Republic of Korea	Meyerhoff Nielsen, M., & Jordanoski, Z. (2020, June)	The results of the study show that the three countries have adopted digital transformation as a strategy to improve public services and bureaucratic efficiency. However, they differ in how they implement digital transformation. Australia chose a decentralized approach by giving autonomy to government agencies. Denmark adopts a centralized approach by developing an integrated digital platform and establishing consistent design standards and principles. Meanwhile, South Korea has opted for a unified approach and is focused on developing innovative technologies such as AI and blockchain.
6	Implementation of Artificial Intelligence (AI) in the Field of Public Administration in the Era of the Industrial Revolution 4.0.	Supriyadi, E.I., & Asih, D.B. (2020)	The study explains the application of Ai in the field of public administration has aided the government in managing and meeting the needs of today's society, which has undergone many changes as a result of technological penetration; however, the application of artificial intelligence has not been able to be used by all government agencies in Indonesia, due to a variety of factors. A considerable budget for establishing technology infrastructure, as well as a lack of preparedness among government human resources in both technical and non-technical capacities.

No	Research Title	Writer	Research Results
7	Digital transformation of the government: A case study in Indonesia	Aminah, S., & Saxon, H. (2021)	According to research, the growth of e-government in Indonesia is gradual and falls behind that of other ASEAN countries. In government institutions, the E-government index is not where it should be. There is a schism between e-government indices and central institutions, as well as between provincial and regency / municipal administrations. Barriers to e-government include: (1) insufficient regulations to encourage and guide e-government; (2) a lack of data integration; (3) gaps in the availability of ICT infrastructure between regions; (4) limited IT skills; and (5) bureaucratic culture and leadership.
8	The Urgency of Transforming Public Services through E-Government in the New Normal and Bureaucratic Regulatory Reform	Lumbanraja, A.D. (2020)	This research discusses the importance of transforming public services through the implementation of e-government in the new normal era, where the public's need for public services is getting higher. In this article, the researcher also highlights the importance of reforming bureaucratic regulations as a necessary step to support the transformation of public services through e-government.
9	Transforming Public Service Delivery: A Comprehensive Review of Digitization Initiatives	J. J. P. Latupeirissa, Ni Luh Yulyana Dewi, I. K. R. Prayana, Melati Budi Srikandi, Sahri Aflah Ramadiansyah, Ida Bagus Gde Agung Yoga Pramana (2024)	Digital transformation in local government improves efficiency, citizen involvement, and government accountability, but must address concerns about inclusivity, accessibility, cost management, and data security.
10	Digital Transformation and Knowledge Management in the Public Sector	A. Alvarenga, F. Matos, R. Godina, João C. O. Matias (2020)	Digital transformation in the public sector is positively related to the quality of knowledge management, leading to significant improvements in citizen engagement and economic growth.
11	Digital Transformation in Public Administration: A Systematic Literature Review	Tiach Mountasser, Marghich Abdellatif (2023)	Digital transformation in public administration can enhance transparency, efficiency, and accountability, while also fostering citizen engagement and participation.
12	Digital transformation: a review, synthesis and opportunities for future research	S. Nadkarni, Reinhard Prügl (2020)	Digital transformation is primarily driven by technology and actors, with underdeveloped aspects such as pace, culture, work environment, and middle management perspectives.
13	Measuring Outcomes of Digital Transformation in Public Administration: Literature Review and Possible Steps Forward	E. Dobrolyubova (2021)	Digital transformation in public administration should be measured for its effectiveness and efficiency, with both benefits and risks accounted for for stakeholders.

No	Research Title	Writer	Research Results
14	Systematic Literature Review: Models of digital transformation in the public sector	Novianto Novianto (2023)	A model for successful digital transformation in the public sector, divided into external, organizational, citizen, and technology elements, can guide managers at various levels in designing effective strategies.
15	Digital transformation success in the public sector: A systematic literature review of cases, processes, and success factors	Fernando Escobar, W. H. C. Almeida, J. Varajão (2022)	This study identified 38 case studies, four processes, and 51 success factors for digital transformation in the public sector, contributing to theory and practice, and identifying new research avenues.
16	Digital transformation: A literature review in the context of international economies and finance	J. .. Marino-Romero, J. A. Folgado-Fernández (2024)	Digital transformation is crucial for countries, markets, and institutions to remain competitive, with implications for both public administrations and international governmental organizations.
17	Digital Transformation for Institution Operations in Higher Education: A Literature Review	Daniel Jahja Surjawan, A. Langi, R. Imbar (2025)	Digital transformation in higher education institutions improves operational efficiency and stakeholder involvement, enhancing educational quality and addressing challenges like digital culture, leadership dedication, and resource allocation.
18	A Systematic Review of the Literature on Digital Transformation: Insights and Implications for Strategy and Organizational Change	A. Hanelt, René Bohnsack, David Marz, Cláudia Antunes (2020)	Digital transformation leads to malleable organizational designs enabling continuous adaptation, driven by digital business ecosystems, and is partially covered by conventional organizational change frameworks.
19	Digital transformation initiatives in higher education institutions: A multivocal literature review	Antonio Fernández, Beatriz Gómez, Kleona Binjaku, E. Meçe (2023)	Higher education institutions are in the early stages of digital maturity, with only 1 in 4 having a digital strategy and 56% implementing isolated digital transformation initiatives without a high strategic return value.
20	Comparative Analysis of Digital Transformation's Impact on Higher Education Institutions: A Systematic Literature Analysis of Public versus Private Sector	O. A. Ajani, Sibongamandla Dlomo (2024)	Digital transformation impacts higher education institutions differently in public and private sectors, with factors influencing success and effectiveness in teaching, learning, administrative processes, and student engagement.
21	Digitally-induced change in the public sector: a systematic review and research agenda	Nathalie Haug, Sorin Dan, Ines Mergel (2023)	Digitally-induced change in public administrations leads to incremental changes and transformative effects on society as a whole.
22	Digital Transformation: An Overview of the Current State of the Art of Research	S. Kraus, Paul Jones, Norbert Kailer, Alexandra Weinmann, Nuria Chaparro-Banegas, N. Roig-Tierno (2021)	Digital transformation research focuses on technological, business, and societal impacts, with gaps identified for future lines of research to adapt to disruptive changes and reduce negative impacts on society and the environment.
23	Sustainable Management of Digital Transformation in	E. Abad-Segura, Mariana-Daniela	Sustainable management of digital transformation in higher education has

No	Research Title	Writer	Research Results
	Higher Education: Global Research Trends	González-Zamar, J. Infante-Moro, Germán Ruipérez García (2020)	experienced an exponential growth in global research, with optimal publication levels in recent years.
24	The role of digital innovation in knowledge management systems: A systematic literature review	A. D. Vaio, Rosa Palladino, A. Pezzi, David E. Kalisz (2021)	Digital innovation in knowledge management systems promotes new business models and performance, with digital transformation tools contributing to long-term value creation and sustainability.
25	Digital transformation: A systematic literature review	Xiaoteng Zhu, S. Ge, Nianxin Wang (2021)	Digital transformation research has progressed through three stages, with influential countries, institutions, and journals, and seven research themes identified.
26	Exploring digital government transformation: a literature review	Giovanni Liva, Cristiano Codagnone, Gianluca Misuraca, V. Gineikyte, Egidijus Barcevicius (2020)	Successful digital government transformation requires a combination of organizational, institutional, legal, ethical, and social factors, not just new technologies.
27	Is digital transformation threatened? A systematic literature review of the factors influencing firms' digital transformation and internationalization	María M. Feliciano-Cestero, Nisreen Ameen, Masaaki Kotabe, J. Paul, Mario Signoret (2023)	Digital transformation can both positively and negatively impact firm internationalization at individual, firm, and macro levels, with human and non-human components playing a significant role.
28	Digital transformation: A review and research agenda	D. Plekhanov, Henrik Franke, Torbjørn H. Netland (2022)	Firms that have successfully transformed are more embedded in platform ecosystems with unclear business boundaries, highlighting a tension between decentralizing and centralizing power during digital transformation.

To delineate more clearly between empirical findings and interpretive discussion, this overview presents only descriptive results, without advancing normative conclusions. The most consistently observed themes across studies include: (i) governance and platform configurations; (ii) capability and capacity limitations—such as in human resources, funding, and data stewardship; (iii) inclusivity barriers, including affordability, accessibility, and language; and (iv) patterns in service outputs, particularly related to efficiency, transparency and accountability, and user participation.

Within this descriptive scope, the evidence base reveals recurrent patterns across the corpus, with notable variations between OECD and non-OECD contexts. While similar themes emerge across all studies—particularly regarding governance structures, capacity constraints, inclusivity challenges, and service outcomes—OECD countries more frequently report established interoperability standards and articulated platform strategies. In contrast, studies from non-OECD contexts highlight more pronounced capacity gaps and context-specific operational limitations.

3.1 Country-Level Patterns (Descriptive Summary)

Table 2 presents a descriptive synthesis of digital transformation models as reported in the most frequently represented countries in the corpus. For each country, it summarizes the key service domains, identified challenges, and observed outcome patterns, as reported by the original study authors. This synthesis remains strictly descriptive and does not include policy interpretation.

Table 3. Country-wise Comparison of Digital Transformation Models (descriptive synthesis)

Country	Governance approach (model)	Interoperability & data governance	Service focus/tech enablers	Noted challenges (reported)	Outcome signals (reported)
Australia	Centralized standards with federated execution; strong whole-of-government guidance	APIs/open standards; privacy/security compliance; cloud adoption	One-stop portals, payments, digital identity/login	Legacy integration; cross-jurisdiction alignment; vendor dependence	Process speed-ups; improved access/uptake; transparency gains
South Korea	Strong central coordination; performance-driven e-gov	Mature interoperability frameworks; analytics use	24/7 service availability; complaint routing; proactive services	Balancing agility with compliance; sustaining inclusivity	High usage; responsiveness improvements; innovation brand effects
United States	Federal model with state/local variation; digital service teams (e.g., 18F/USDS)	Open data norms; varied identity approaches; modular procurement	Permitting/licensing, benefits, tax, service design labs	Fragmentation across jurisdictions; procurement rigidity	Service redesign wins; unevenness across states/agencies
Indonesia	Hybrid/central guidance with local execution; program-based rollouts	Interoperability in progress; data protection evolving	City services, civil registry, sector pilots (health/education)	Capacity gaps, digital divide, sustainability beyond pilots	Point improvements; scale-up variability; inclusivity concerns

3.2 Sectoral coverage and dominance

Studies most frequently covered "city services/one-stop portals," followed by health and education; social protection and licensing/permitting appear as focused pilots. This sectoral pattern is consistent with early value capture (high-volume transactions) and available administrative data.

Table 4. Sectoral coverage and typical outcomes (descriptive)

Sector (dominant in corpus)	Typical initiatives	Common outcomes noted
City services / one-stop portals	Payments, permits, complaints, service status tracking	Reduced processing times; higher uptake; transparency
Health	e-records, appointments, telehealth pilots	Access gains where infrastructure exists; data-sharing hurdles
Education	enrollment, certification, learning platforms	Convenience; uneven adoption outside urban centers
Social protection & licensing	benefits delivery, identity verification, licensing	Faster eligibility checks; risks of exclusion without assisted channels

Descriptive findings across studies show that positive outcomes (efficiency & access) generally occur when processes are redesigned before digitization, digital identities—payments—and case management are interconnected, and there are interoperability standards that are adhered to across

agencies. In contrast, achievement tends to be limited when digitalization simply "moves forms" without process engineering, or when data infrastructure and governance (quality, data protection) are inadequate.

3.3 Thematic coding roll-up (descriptive)

The descriptive evidence converges around six thematic categories: (i) governance models, including lead agency roles and platform governance arrangements; (ii) capability and capacity gaps, encompassing skill shortages, funding constraints, change management challenges, and data stewardship limitations; (iii) inclusivity and equity challenges, such as the digital divide, accessibility barriers, and language issues; (iv) enablers, including leadership commitment, legal clarity, and the presence of technical and institutional standards; (v) obstacles and risks, particularly cybersecurity threats, privacy concerns, and vendor lock-in; and (vi) policy outputs and impacts, with emphasis on service efficiency, quality, and mechanisms for participation and accountability.

These findings were consolidated into six thematic groups through the coding process described in the Methods section: (i) governance models, (ii) capability and capacity gaps, (iii) inclusivity and equity challenges, (iv) enablers, (v) obstacles and risks, and (vi) policy outputs and impacts. A thematic operational summary—linked to Table 1 (Method/Codebook)—provides detailed information on code inclusion and exclusion criteria, coding rules, and illustrative examples to support transparency and replicability.

Discussion

Digital Transformation

Cross-study findings show that the variation in public sector digital transformation outcomes is mainly influenced by platform governance models, organizational readiness (capabilities/capacity), and service process design that precedes digitalization; these patterns are consistent across the context of the countries and sectors covered, as summarized in Table 2 and Table 3 (Janssen & van Veenstra, 2015; Cordella & Paletti, 2019; Gil-Garcia et al., 2020). In OECD cases, a combination of platform governance (interoperability standards, reference architectures, API policies) and agile digital services teams tend to reduce fragmentation and maintain a continuous improvement cycle (Ubaldi et al., 2019; OECD, 2020); Conversely, in non-OECD contexts, spot solutions (sectoral portals/pilots) emerge faster but face fluctuating capacity and funding cycles so that their scale and consistency are more varied (Schuppan, 2009; Gil-Garcia et al., 2020). In both groups, the strongest output signals occur when process redesign takes precedence and identity, payment, and case-management systems are integrated through a shared data standard (Janssen & van Veenstra, 2015; Ubaldi et al., 2019).

The dominance of the "city services/one-stop portals" sector in the corpus can be explained by the high-volume and relatively standardized nature of transactions resulting in visible "quick wins" (Anthopoulos et al., 2016; Gil-Garcia et al., 2020); The health sector develops both when the identity infrastructure and service provider systems are mature (OECD, 2020), while the education sector follows the availability of devices/connectivity and LMS governance at the institutional level (Ifinedo, 2017). In social protection and licensing, progress depends on the ability to share data for feasibility verification, but is sensitive to the risk of exclusion if assistive channels, accessibility, and language localization are not designed from the outset (Cordella & Paletti, 2019; Ubaldi et al., 2019).

A number of cases are less successful when portals simply digitize forms without re-engineering the workflow ("paving the cow paths"), so that the cycle time and user load do not change much (Janssen & van Veenstra, 2015; Schuppan, 2009). Vendor-centric "smart city" initiatives with unopened standards give rise to lock-ins and fragile integrations, raising lifecycle costs while slowing innovation (Anthopoulos et al., 2016). Analytics/AI pilots stall when data governance and MLOps capacity lag behind (data quality, consent management, auditability), which in turn triggers regulatory/compliance objections (OECD, 2020; Gil-Garcia et al., 2020). From an equity perspective, inequality arises when

assistive channels, accessibility for people with disabilities, and language localization become a later consideration, so that benefits are more concentrated on already connected users (Cordella & Paletti, 2019; Ubaldi et al., 2019).

Policy discussions also raised recurring tensions, including centralization versus local autonomy, data openness versus data protection, cloud-first versus data sovereignty, speed versus accountability, and automation versus inclusion (OECD, 2020; Gil-Garcia et al., 2020). Centralized platforms accelerate scale but risk stifling local adaptation. Hybrid arrangements with guardrails, such as standards and SLAs, provide room for innovation at the forefront while maintaining interoperability (Ubaldi et al., 2019). The push for data sharing for innovation can clash with privacy regulations; therefore, privacy-by-design approaches, differential access control, and lineage tracking are prerequisites (OECD, 2020). Multi-cloud strategies with portability minimize the risk of lock-in while accommodating residency/sovereignty restrictions (Anthopoulos et al., 2016). Agile approaches that accelerate value must be accompanied by embedded guarantees (security, accessibility, ethics) so as not to cause rework or adverse impacts (Cordella & Paletti, 2019). In eligibility automation, the principle of "no wrong door" and assistive digital options are important to prevent the exclusion of edge cases (Ubaldi et al., 2019).

The practical implications are to place process redesign and standardization before portalization, utilize APIs and case-management for traceability, and invest in the "capability stack" (product, data, security, service design) along with assistive channels to maintain inclusion (Janssen & van Veenstra, 2015; Cordella & Paletti, 2019). Platform governance needs to enforce interoperability while enabling modular modernization and vendor portability; Analytics/AI maturity should be staged after the foundation of data governance (quality, lineage, approval, audit) is adequate (OECD, 2020).

For the research agenda, a longitudinal comparative study is needed to assess how governance models (platform vs. federative) interact with the character of the sector in shaping long-term outcomes—including post-pilot sustainability and distributional impacts on vulnerable groups (Gil-Garcia et al., 2020). A mixed-method approach that combines service performance metrics with inclusion and public trust indicators will enrich a cause-and-effect understanding that until now has relied heavily on descriptive studies (Cordella & Paletti, 2019; OECD, 2020).

The application of digital technology to improve or replace existing outdated systems characterizes the process of change or evolution of business, organizational, and government systems known as digital transformation (Zhu, Ge, & Wang, 2021; Plekhanov, Franke, & Netland, 2022). Digital transformation focuses on the innovative use of information and communication technology (ICT) to improve organizational performance and accelerate business growth (Kraus et al., 2021; Hanelt, Bohnsack, Marz, & Antunes Marante, 2021; Di Vaio, Palladino, Pezzi, & Kalisz, 2021). Digital transformation continues to evolve in tandem with technological advancements and is considered an essential strategy in modern business competition, particularly due to its connection to digital platform ecosystems and the increasingly blurred boundaries between industries (Nadkarni & Prügl, 2021).

Digital transformation involves the use of information and communication technologies such as the internet, big data, cloud computing, artificial intelligence (AI), and the Internet of Things (IoT) (Viana, 2021; Janssen & van der Voort, 2016). The use of these technologies enables organizations to manage information and data more effectively, accelerate decision-making processes, reduce operational costs, and improve service quality, including strengthening knowledge management as a driver of public value (Pang, Lee, & DeLone, 2014; Di Vaio et al., 2021). Digital transformation also enables organizations to enhance productivity and efficiency while increasing their ability to adapt to market changes. However, the pace of change, organizational culture, and the perspectives of middle management often lag behind the speed of technological innovation and the research agenda (Haug, Dan, & Mergel, 2023).

Digital transformation also affects organizational culture and the way employees work. It can introduce new concepts such as remote working, global collaboration, flexible working arrangements, and adaptive organizational structures that facilitate sustainable transformation (Abad-Segura, González-Zamar, Infante-Moro, & Ruipérez-García, 2020). The application of digital technology can also make work easier and reduce the need for human labor in several aspects of operation. Digital

transformation not only impacts organizations but also society at large. For instance, online transportation services such as Uber and Grab have transformed mobility; e-commerce has changed shopping behavior; and digital public services have expanded citizen participation (Hendriyaldi, Erida, & Yanti, 2022; Lumbanraja, 2020). Moreover, digital transformation has enabled more effective telemedicine, online learning, and electronic-based government services (Firdaus, Tursina, & Roziqin, 2021).

However, implementing digital transformation also requires significant investment and systemic support, including the development of technology infrastructure, enhancement of employee digital skills, and continuous managerial commitment (Alvarenga, Matos, Godina, & Matias, 2020). Additionally, the implementation of digital transformation requires strong leadership from top management and the active involvement of all organizational staff, accompanied by a clear framework for evaluating outcomes in terms of effectiveness and efficiency (Dobrolyubova, 2021). On a macro level, the drive for transformation is also closely linked to the competitiveness of nations, markets, and institutions (Marino-Romero & Folgado-Fernández, 2024).

Overall, digital transformation is a process of continuous change that demands high commitment and long-term investment. However, if properly implemented, it can provide significant benefits for organizations and society, including improved efficiency, productivity, and service quality, as well as enhanced competitiveness in increasingly dynamic markets, while also requiring awareness of the trade-offs and risks at individual, organizational, and systemic levels (Hanelt et al., 2021; Escobar, Almeida, & Varajão, 2023).

Digital Transformation in Government (Digital Government)

Digital transformation in government, also known as digital government, is an effort to transform or change the way government operates by integrating digital and information technology into all aspects of public services and government operations. The main goal of digital transformation in government is to increase efficiency, effectiveness, transparency, and accountability in the delivery of public services, which demands a combination of organizational, institutional, legal, ethical, and social factors—not just the adoption of new technologies (Pangandaheng et al., 2022).

One of the main focuses is improving the quality of public services through accessible digital channels. Digital platforms, big data, and analytics can support better decisions and integrated information management while encouraging citizen engagement (Lumbanraja, 2020) and increased accountability (Patrisia & Anwar, 2021). Additionally, digital transformation enhances data-driven co-creation practices for policy adaptation (Hardi & Gohwong, 2020) and public knowledge management (KR et al., 2023).

Another aspect is technology-enabled citizen participation in decision-making—for example, through feedback channels, collaboration platforms, and online complaint systems—which have been shown to increase involvement while demanding attention to inclusivity and accessibility (Mahanum, 2021). In addition, governments benefit from structured models that map external elements, organizations, citizens, and technology as a guide for strategy design (Perifanou & Economides, 2019), as well as from mapping cross-case success factors (Patrisia & Anwar, 2021).

Challenges include data security and privacy concerns, limited budgets and skills, and gaps in policy and regulations. Therefore, a mature strategy and plan, along with government–private–community collaboration, are necessary to strengthen resilience and ensure equal access. In particular, the literature confirms that many digital-induced changes are incremental but have a transformational impact on society at large (Rindengan, 2016). At the same time, the digital maturity of the public/higher education sector is still in its early stages and often fragmented, lacking a comprehensive strategy (Saputra et al., 2021; Setyasih, 2022; Supriyadi & Asih, 2020).

Overall, digital government brings significant benefits to service efficiency, citizen participation, and the quality of decision-making. However, the tension between the centralization–decentralization of authority and attachment to the platform ecosystem needs to be managed as institutional design

dynamics (Janssen & van der Voort, 2016), while the research agenda highlights future development directions to reduce negative social–environmental impacts (United Nations, 2016) and clarify the measurement of outcomes (Mattajang et al., 2022).

The Benefits of Digital Transformation in the Government Sector

Digital transformation has brought many benefits. First, it accelerates administrative and decision-making processes through automation and data-driven operations, which are associated with increasing public value and organizational capabilities (Patrisia & Anwar, 2021; KR et al., 2023). Second, it increases transparency and accountability via open data and traceable digital workflows, which encourages citizen engagement (Lumbanraja, 2020). Third, it improves service quality and accessibility via online channels, but it still needs to ensure data inclusivity and security (Mahanum, 2021).

Fourth, it enhances operational efficiency through process automation and improved information management, including the utilization of digital knowledge management systems (Layne & Lee, 2001) and cross-process orchestration, which are identified as success factors (Patrisia & Anwar, 2021). Fifth, it can reshape work culture, including cross-unit collaboration, agile work patterns, and adaptive organizational design (Hardi & Gohwong, 2020). Finally, it helps governments address broader socio-economic shifts and opportunities, both in the national and international realms (Meyerhoff & Jordanoski, 2020) and in the context of internationalization and the associated risks (Pang, Lee, & DeLone, 2014).

Across sectors, evidence in higher education indicates improved operational efficiency and stakeholder engagement; however, maturity and strategy still vary (Setyasih, 2022; Saputra et al., 2021; Supriyadi & Asih, 2020). Global research trends also emphasize the continuous management of digital transformation and the exponential growth of publications in recent years (Viana, 2021; Abad-Segura et al., 2020), as well as the large-scale theme maps and phases of development in this field (United Nations, 2016; West, 2007; Hanelt et al., 2021; Kraus et al., 2021).

Digital Transformation in Government in Several Countries

To address the reviewer's comments, this section presents a comparative discussion of digital transformation efforts in the United States, Australia, and the Republic of Korea, focusing on differences in governance structures, technological architectures, and citizen interface design. These national experiences are interpreted through the thematic lens identified in the cross-study synthesis—particularly platform governance, service integration, and inclusivity.

The United States exhibits a federal and decentralized model, where digital efforts are steered by entities such as the Office of Management and Budget (OMB) and the U.S. Digital Service (USDS), but implementation remains fragmented across federal and state agencies. The technological ecosystem favors modular systems, open APIs, and cloud-first principles, resulting in a flexible but inconsistent service environment. Although the Digital Service Playbook emphasizes user-centered and accessible design, variable adoption across jurisdictions undermines coherence. This pattern aligns with the thematic finding that federated governance can drive innovation but poses challenges for interoperability—characteristic of OECD countries undergoing "agile but fragmented" modernization.

Australia demonstrates a more coordinated federated approach, led by the Digital Transformation Agency (DTA). Initiatives such as myGov and Service NSW reflect a whole-of-government architecture, integrating access to diverse services through a unified digital platform. The technology stack supports shared identity systems and data standards, reinforced by a national design system. Its citizen interface follows a "one front door" principle, ensuring consistency and clarity across services and jurisdictions. This case reflects the cross-study insight that platform standardization strengthens inclusivity and public trust.

The Republic of Korea represents a highly centralized, state-driven model, marked by early investments in infrastructure, universal ID systems, and integrated data platforms. Its vertically integrated technology enables real-time data exchange and automated service delivery, exemplifying

process redesign as a precursor to portal development. However, this strength also raises tensions between integration and privacy—a policy concern echoed across OECD discussions on digital governance.

Table 5. Comparative Summary: Governance, Technology, and Citizen Interface

Dimension	United States	Australia	Republic of Korea
Governance Structure	Federal and decentralized; agencies retain autonomy under OMB/USDS guidance.	Federated but centrally coordinated via DTA; strong national standards.	Highly centralized, state-led coordination; integrated ministries and data hubs.
Technology Stack	Modular, API-driven, cloud-first; fragmented across agencies.	Shared identity, interoperability frameworks, national platforms (myGov).	Vertically integrated systems with centralized data infrastructure.
Citizen Interface	User-centered portals; variable experience across agencies.	Unified "one front door" design; consistent user experience.	Proactive and automated service delivery; minimal citizen input.
Strengths	Agility and innovation; open standards.	Consistency, inclusion, and interoperability.	Efficiency, automation, and integrated data use.
Challenges	Fragmentation, uneven adoption, interoperability gaps.	Complexity of multi-level coordination; legacy data issues.	Privacy concerns; risk of over-centralization.
Link to Thematic Findings	Reflects "agile but fragmented" platform governance.	Embodies "standardization before digitalization."	Demonstrates "integration and automation before portalization."

Across the three countries, the findings consistently indicate that governance coherence, data interoperability, and inclusive design are the key determinants of sustainable digital transformation. Centralized governance models, as seen in Korea and Australia, enable greater scale, policy coherence, and integration, whereas decentralized models, such as that of the United States, encourage innovation and agility but risk fragmentation across agencies. From a technological perspective, the adoption of shared standards, interoperable data frameworks, and modular APIs strengthens system adaptability and facilitates long-term modernization. Meanwhile, proactive or unified citizen interfaces—where inclusion and accessibility are embedded from the outset—enhance public trust and service equity. Collectively, these comparative insights extend the cross-study synthesis by demonstrating that successful digital government transformation depends less on technological sophistication and more on institutional alignment, governance capacity, and process redesign preceding digitization [(Ubaldi et al., 2019; Gil-Garcia et al., 2020; OECD, 2020)].

A Citizen-Centric and Adaptive Model of Digital Transformation in Government

Existing literature on digital transformation in government has largely been shaped by linear or stage-based models that emphasize technological adoption and the digitization of administrative processes (Layne & Lee, 2001; Dunleavy et al., 2006). While these models offer valuable structural insights, they often underemphasize the centrality of citizens and the need for governments to adapt dynamically to evolving societal demands and technological change.

To address these limitations, this paper introduces a Citizen-Centric and Adaptive Model of Digital Transformation in Government. Unlike traditional models, it embeds continuous citizen engagement throughout the entire transformation lifecycle. Rather than treating citizen feedback as a final evaluative step, this model incorporates an iterative engagement loop, where public input shapes service design, implementation, and refinement in real time. This co-creative process ensures alignment with citizen needs and enhances public value (Bovaird & Löffler, 2012).

The model also integrates data-driven policy adaptation, leveraging insights from digital interactions to inform responsive policymaking. This approach goes beyond monitoring service

performance, using behavioral data and predictive analytics to identify emerging needs and adapt service delivery accordingly (Janssen & van der Voort, 2016). In parallel, it promotes agile and modular service development to allow greater responsiveness to technological change and shifting user expectations. This contrasts with traditional waterfall methodologies, which often inhibit flexibility and speed (Conboy, 2009).

A core component of the model is a resilience and inclusivity framework. It emphasizes building robust digital infrastructure capable of withstanding disruptions while ensuring equitable access to services. Special attention is given to addressing the digital divide and making services accessible to marginalized communities (United Nations, 2016).

The proposed model is visually represented as a dynamic, non-linear system. Its components are interconnected to highlight the adaptive process, continuous feedback loops, and the central role of citizens in shaping digital transformation efforts.

4. CONCLUSION

This systematic literature review finds that the success of digital transformation in government is less dependent on technological advancement and more strongly influenced by platform governance, organizational capacity, and active citizen involvement. Cross-country evidence highlights the critical roles of data architecture, interoperability standards, cross-agency coordination, and inclusive service design. Building on these insights, the study proposes the Citizen-Centric Adaptive Model, which repositions citizens as central actors in public value creation and emphasizes the iterative, feedback-driven nature of transformation. However, the research is limited by the underrepresentation of empirical studies from low- and middle-income countries (LMICs) and non-urban settings, which constrains the generalizability of findings across diverse governance contexts. Future research should prioritize comparative and longitudinal case studies in LMICs to capture the evolving dynamics of digital transformation, including both successes and setbacks. Additionally, there is a need to develop integrated indicators that assess not only service performance but also inclusivity and public trust, to test and refine citizen-centered models empirically.

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