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Digitalization of Public Sector AIS in Indonesia: Opportunities and Challenges (A Systematic Literature Review)

ABSTRACT

This research systematically investigates the effective implementation of digital transformation in the public sector, with a focus on the renewal of Accounting Information Systems (AIS) as a key component. Employing a Systematic Literature Review (SLR) approach based on the PRISMA framework, the study identified, selected, and analyzed 39 relevant articles sourced from the Scopus database. The analysis centers on implementation, contributing factors, challenges, and opportunities, with a specific focus on the Indonesian context. The findings indicate that digital transformation is a fundamental paradigm shift from simply E-Government towards a more holistic and collaborative Government as a Platform (GaaP) model. The success of implementation is contingent upon factors like robust political leadership, a cohesive policy framework, and multi-stakeholder collaboration. On the other hand, the process is frequently impeded by significant hurdles, such as bureaucratic fragmentation, sectoral protectionism, outdated legacy systems and a skills gap in digital literacy among public officials. While these challenges are acute in Indonesia, they are offset by strategic opportunities to achieve technological leapfrogging and scale up successful local initiatives nationwide. This research concludes that AIS transformation is not the goal, but a pivotal enabler for the successful digital transformation of the entire public sector.

Keywords: digital transformation, accounting information system, public sector.

INTRODUCTION

As a field of study, the digital transformation of public sector Accounting Information Systems (AIS) represents the convergence of technology, governance, and financial management. In recent years, its importance has grown, largely due to increased pressure for greater transparency, efficiency, and responsiveness to new technologies. This process entails more than just applying new technology; it demands a foundational rethinking of how governments manage financial information, interact with citizens to improve transparency, and ultimately, enhance the services delivered.

The integration of digital technology into public sector AIS is vital for improving financial reporting quality. This is supported by Mu (2023), who noted that digital transformation significantly affects accounting information quality through superior data integration and analysis (Mu, 2023). Beyond this, the implementation of digital transformation can also enhance public services. Filgueiras et al (2019) suggested that financial crises can serve as a "catalyst" for digital transformation in the public sector, accelerating the digitalization of its services (Filgueiras et al., 2019). This highlights the potential of digital transformation to not only streamline

internal processes but also to increase the overall effectiveness of government services.

A primary goal of digital transformation in the public sector is ensuring broad information access and equitable public services. With increased access to information, the public now demands greater government transparency and accountability in services, budgeting, and policymaking. This echoes the findings of Nwozor et al (2022), which suggest that digitalization offers real-time information access and better government public engagement (Nwozor et al., 2022). Practically, public sector digitalization enhances service access in public administration (Imanbekova et al., 2024), speeds up decision making (Tangi et al., 2021), and improves collaboration across departments (Ha et al., 2022). This dual benefit improves government efficiency while increasing citizen satisfaction through swift, responsive services well documented (Latupeirissa et al., 2024; Nurfadilah & Haliah, 2024). Beyond service delivery, digital transformation also bolsters democratic participation by using digital platforms to facilitate active engagement between citizens and government institutions (Djoldasova, 2022).

The socio-economic implications of digital transformation go far beyond improved services and information access. Nwozor et al. (2022), for example, argue that transparent digital systems curb opportunities for the abuse of power (Nwozor et al., 2022). Likewise, Androniceanu et al (2022) link the technological and political drivers of digitalization in the EU to the direct promotion of transparency and anti-corruption efforts (Androniceanu, Georgescu, & Kinnunen, 2022). For this reason, the government's role in facilitating the adoption of digital transformation should not be overlooked. Yang (2023) advises that governments should actively drive digital transformation, beginning with small and medium-sized enterprises (SMEs), to enhance their service delivery (Yang, 2023).

The main goal of this study is to systematically explore the effective implementation of digital transformation within the public sector, with a focus on AIS renewal across various nations through a Systematic Literature Review (SLR). The research will also examine the influence of external factors, including government policy and technological advancements, on the digital transformation of public sector AIS. Consequently, the study aims to offer insights into the challenges and opportunities confronting public organizations in Indonesia's digitalization journey and to pinpoint best practices for improving efficiency, transparency, and public service delivery. By comprehending these dynamics, the research aspires to contribute significantly to advancing public sector accounting policies and practices in Indonesia.

LITERATURE REVIEW

This literature review seeks to construct a strong conceptual framework by tracing the foundational literature on the digital transformation of public sector accounting information systems. It focuses on four interconnected domains: the evolution of the New Public Management (NPM) paradigm as a reform driver; the role of information technology in government; the concepts of digitalization and digital transformation; and an analysis of the impacts of this

transformation on the public sector and its accounting information systems. Ultimately, this review will identify the theoretical foundations explaining the necessity, process, and consequences of the phenomenon being investigated.

As a crucial starting point, the New Public Management (NPM) paradigm emerged as a reform movement in public administration. It advocates for applying private sector management practices to the public sector to improve efficiency, effectiveness, and accountability (Hood, 1991). Core principles like results orientation, competition, and performance-based management fundamentally reshaped expectations of government bureaucracy. Hood (1991) argues that NPM compels public sector units to adopt private sector management and accounting practices to better serve the public. This paradigm shift inherently requires more sophisticated performance measurement, transforming accounting from a simple record-keeping tool into a strategic instrument for evaluation and decision-making.

The impact of NPM on public sector accounting is profound. To measure performance and prove accountability, public entities need accounting information systems (AIS) that can generate dependable, relevant, and timely financial information. Weiss et al. (1995) stress the importance of an entrepreneurial, results-oriented government (Weiss et al., 1995). Consequently, a demand for accounting reforms arises, such as the transition from cash-based to accrual-based accounting, enabling a more thorough measurement of service costs and financial performance. Therefore, NPM can be viewed as the demand side of the equation, creating a pressing need for the public sector to overhaul its AIS to meet modern managerial requirements.

While NPM increases the demand for reform, developments in information technology (IT) supply to make it feasible. E-Government was an initial manifestation of this, using IT to improve both public services and internal government processes. According to Heeks (2020), E-Government is the use of ICT to better achieve public policy objectives (Heeks, 2020). Early E-Government initiatives often began with informational websites and later expanded to include transactional services, such as online tax payments and licensing. These foundational initiatives paved the way for the broader digitalization of government processes, including core financial and accounting functions.

Applying IT in government directly influences accounting information systems. Manual or semi-automated AIS began their transformation into integrated, computerized systems. This shift improved efficiency in recording and reporting while also unlocking the potential for stronger internal controls and more profound data analysis. A study by Pina et al. (2010) indicates that ICT adoption in local governments correlates positively with the degree of transparency and the online availability of financial data (Pina et al., 2010). The focus of digitalization, therefore, is on optimizing what is already being done. On the other hand, digital transformation is a far deeper concept than mere technology.

Digital transformation has a wide-ranging impact on the public sector, primarily by enhancing transparency and accountability. Integrated, real-time AIS allows governments to provide faster, easier public

access to information on budgets and spending, which in turn strengthens public oversight. This supports the view of Mergel et al. (2019) that digital transformation creates 'public value' through greater openness, citizen participation, and collaboration (Mergel et al., 2019). In a similar vein, Djoldasova (2022) highlights that digital platforms facilitate active public involvement in government decision-making (Djoldasova, 2022). Thus, a digitally transformed AIS evolves beyond a simple compliance tool to become a platform for government-citizen dialogue and interaction.

Furthermore, the digital transformation of public sector AIS also directly elevates public service quality through faster processes, a leaner bureaucracy, and data-driven decision making. For example, a modern AIS that integrates population and social assistance data can lead to more targeted and efficient aid distribution. Nevertheless, the process is not without significant hurdles. These include the demand for infrastructure investment, cybersecurity risks, the public digital divide, and critically, the imperative to develop digital capabilities and culture within the civil service (Janowski, 2015).

In conclusion, the literature suggests a distinct evolutionary progression. The New Public Management (NPM) paradigm established the demand for a high-performing, accountable government. In response, Information Technology (IT) and E-Government provided the initial supply of tools to address this demand. Subsequently, digital transformation emerged as a holistic paradigm, integrating technology into the core of governmental strategy and operations to fundamentally create public value. Within this context, the transformation of public sector AIS is positioned not as an ultimate objective but as a critical enabler for the success of the overarching digital transformation. This study, therefore, seeks to address a gap in the literature by systematically analyzing this transformation process with a focus on its contextual variations, inherent challenges, and emergent best practices.

RESEARCH METHODS

This study employs a Systematic Literature Review (SLR) methodology. The SLR methodology provides a systematic approach for the identification, analysis, and synthesis of existing research and theoretical frameworks pertinent to the topic under investigation. This approach facilitates an in-depth comprehension of how digital transformation is effectively implemented within public sector AIS across diverse national contexts. Furthermore, it allows for an examination of its role in enhancing efficiency, transparency, and the quality of public service delivery.

The SLR methodology employed in this study adheres to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses 2020 (PRISMA 2020) guidelines. As an update to the 2009 version, the PRISMA 2020 statement provides a framework that assists researchers in transparently and systematically identifying, selecting, appraising, and synthesizing relevant literature (Page et al., 2021). The PRISMA process adopted for this research encompasses three primary stages: identification, screening, and eligibility assessment for final inclusion.

The initial stage of the SLR process was database identification. The literature search

was conducted on a single, comprehensive online database, Scopus, which is recognized for its extensive repository. Scopus was selected as it is one of the largest databases of scientific works with a significant impact on academic journals (Ezenwoke et al., 2019). The decision to use a single database was a deliberate strategy to prevent the occurrence of duplicate entries among the retrieved articles (Monteiro & Cepêda, 2021). The inclusion criteria stipulated that articles must be original research, published in English, and issued within the last five years (2020–2025). The search query was constructed using the following keywords: digital transformation, accounting information systems, public sector, and government sector.

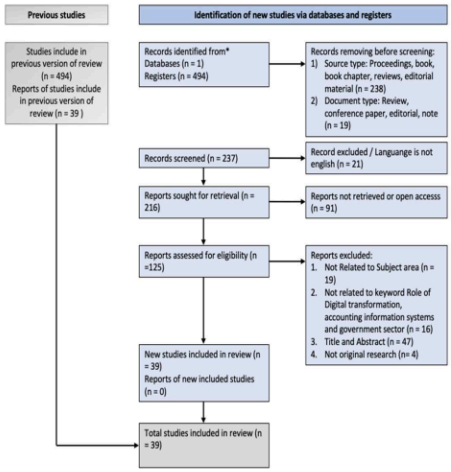


Figure 1.
Sample Process Selection (PRISMA Flow Diagram)

The search query used the Scopus database, thus: title, abstract, and keyword fields (TITLE-ABS-KEY) using the following Boolean string: ("Digital Transformation") AND ("Public Sector") OR ("Accounting Information System") AND ("Government Sector"). This initial search yielded 494 potentially relevant documents, comprising 256 journal articles, 122 conference proceedings, 81 book series, and 35 books. In the first screening phase, the search was restricted to journal articles only. During the screening process, the document type was limited to 'journal articles', which excluded 238 documents (122 proceedings, 31 books, and 81 book series). An additional screening based on document classification was performed, where only items categorized as 'articles' were retained, removing an additional document such as reviews, conference papers, editorials, and notes (n = 19).

The second stage involved the screening of the identified articles to ascertain their relevance and eligibility based on predefined criteria. Initially, a screening of titles and abstracts was conducted, leading to the exclusion of articles that were not aligned with the research keywords (n = 16) or were irrelevant to the study's objectives (n = 47). Subsequently, further exclusions were made based on specific criteria, including publications not written in English (n = 21), articles that were not open access (n = 91), materials outside the defined subject scope (n = 19), and documents that were not original research articles (n = 4). Following the multi-stage screening process, the final sample of 39 scientific articles was retained for synthesis. The entire article selection process is detailed in the PRISMA flow diagram presented in Figure 1.

RESULT AND DISCUSSION

Digital transformation has emerged as an inevitable trajectory for public sector reform globally, underpinned by a profound shift in governance paradigms. This evolution is primarily driven by rapid technological advancements and increasing citizen expectations for efficient digital services (Debeljak & Dečman, 2022; Edelmann & Mergel, 2021). This literature review organizes the findings into three interrelated thematic areas: (1) the implementation of digital transformation in the public sector, (2) the factors influencing the digital transformation process and the use of Accounting Information Systems (AIS) in public institutions, and (3) the challenges and opportunities in digital implementation in Indonesia. The analysis integrates key concepts in digital governance, such as Government as a Platform (GaaP), Artificial Intelligence (AI), and the Internet of Things (IoT), to provide a comprehensive overview of the current research.

Implementation of digital transformation in the public sector

Digital transformation in the public sector represents a fundamental shift, evolving as a necessity and a catalyst for enhanced citizen engagement and economic development (Alvarenga et al., 2020; Vial, 2019). This change is primarily driven by the strategic application of digital technologies, which compel organisations to restructure their processes and operational systems (Dečman et al., 2022; Tangi et al., 2021). This transformation marks a shift from the traditional concept of e-government, which focused on online service delivery, toward more dynamic frameworks such as digital government transformation (DGT) and transformational government (t-gov), where

technology is leveraged to generate greater public value (Androniceanu, Georgescu, & Sabie, 2022; Dečman et al., 2022; Maulana et al., 2024).

The primary objectives of this transformation include improving the efficiency, effectiveness, transparency, and quality of public services (Andersson et al., 2022; Galushi & Malatji, 2022; Shibambu & Ngoepe, 2024). Governments now face growing pressure from citizens, whose expectations have been shaped by innovative and real-time digital services in the private sector (Debeljak & Dečman, 2022; Edelmann & Mergel, 2021). One of the most widely adopted frameworks is Government as a Platform (GaaP), inspired by private sector business models. This framework envisions the government as an open platform that fosters collaboration and interaction among various stakeholders, including the public (Li et al., 2023; Seo & Myeong, 2020). GaaP comprises four critical components: producers (service creators), consumers (service users), providers (infrastructure), and owners (government), all aimed at enhancing efficiency, participation, and public value (van Alstyne et al., 2016 as cited in Seo & Myeong, 2020).

Estonia is often cited as a successful example of comprehensive GaaP implementation. Its decentralized X-Road system connects databases across public and private sectors, facilitating 99% digital public services, including e-Police, e-Business, and e-voting (Androniceanu, Georgescu, & Sabie, 2022; Seo & Myeong, 2020). Estonia has also adopted blockchain technology and developed digital embassies abroad to ensure data integrity and security. In the United Kingdom, the Government Digital Service (GDS) created an integrated platform (GOV.UK), which includes shared digital components such as identity (GOV.UK Verify), payment (GOV.UK Pay), and notification systems (GOV.UK Notify), used by hundreds of departments (Seo & Myeong, 2020). Similarly, Italy's Agenzia per l'Italia Digitale (AgID) adopted GaaP to launch national digital services like SPID and PagoPA, fostering cross-sector innovation Di Giulio & Vecchi, 2023; Cordella & Paletti, 2019 as cited in Li et al., 2023; Seo & Myeong, 2020)).

Many countries also utilise an "institutionalisation" strategy, forming dedicated units or agencies to facilitate collaboration and lead transformation. Italy established a task force of industry experts and public officials (Di Giulio & Vecchi, 2023), China created regional Big Data Bureaus (Jiang et al., 2024), and Indonesia's West Java province formed Jabar Digital Service (JDS) as a dedicated digital initiative unit (Maulana et al., 2024). Digital transformation in the public sector also includes deploying technologies like Artificial Intelligence (AI) and the Internet of Things (IoT). In China, AI platforms in Shenzhen have been used to automate assignments, monitor performance, and assist civil servants, promoting agile governance (Li et al., 2023; Sobrino-García, 2021). In Spain, AI helps detect potential corruption in public procurement (Sobrino-García, 2021), while South Africa applies AI in its e-filing tax systems (Shibambu & Ngoepe, 2024). The use of IoT, according to Hu et al. (2022), aims to reduce time and cost in public service management (Hu et al., 2022).

Collaborative service production (co-production) between governments, citizens, and the private sector is another hallmark of digital transformation. Austria's co-production model involved citizens in

developing digital tax services (Edelmann & Mergel, 2021), and West Java's Penta helix collaboration model engaged with academic people, businesses, communities, government, and media press to address local challenges (Maulana et al., 2024). Implementation approaches vary across countries. Hungary achieved more effective digitalization through a centralised service centre model, while Romania's fragmented sectoral approach proved less effective (Dragan et al., 2024). External crises such as the COVID-19 pandemic have acted as catalysts for digital transformation. Studies on Bangladesh and Jordan demonstrate how governments leveraged ICT to enhance disaster relief transparency and participation (Alhanatleh et al., 2024; Zakir Hossain, 2021), while Brunei's crisis response led to the rapid development of BruHealth, a contact-tracing app using big data and AI through public-private collaboration (Sait & Ali, 2022).

In summary, digital transformation in the public sector encompasses a wide array of initiatives—from adopting specific technologies like e-invoicing in Europe (Bojanc et al., 2024) to complete service model shifts through frameworks like GaaP. The collective findings emphasize the strategic role of technology, collaborative governance models, and continuous learning from past implementations.

Factors Influencing the Digitalization Process and AIS in Public Institutions

The success and failure of digital transformation and the modernisation of Accounting Information Systems (AIS) in the public sector are shaped by the interplay of various drivers, enablers, and barriers. A consistent theme in the literature is that these factors extend beyond technology and include policy, organisational, human, and social dimensions. A fundamental driving factor is strong leadership and political vision. A clear governmental vision also significantly influences the direction and momentum of public sector digital initiatives, as seen in Italy and South Korea (Di Giulio & Vecchi, 2023; Kim & Kim, 2021).

Policy frameworks, strategic plans, and governance models that are interconnected also play a crucial role in determining the success of digital transformation. Countries supported by robust policies, such as Open Data or e-invoicing in the European Union, exhibit more structured progress (Bojanc et al., 2024; Vaccari et al., 2021). In contrast, the lack of integrated frameworks, as seen in South Africa, has hindered effective implementation (Shibambu & Ngoepe, 2024). The model of governance, whether centralized like in Hungary or fragmented as in Romania, also significantly affects alignment, pace, and implementation effectiveness (Dragan et al., 2024).

Stakeholder collaboration and engagement models are key enabling factors. Collaborative approaches such as Indonesia's "Penta helix" and Austria's co-production model demonstrate that inclusive engagement with private sectors, academia, communities, and the public can generate relevant and sustainable solutions (Edelmann & Mergel, 2021; Maulana et al., 2024). Bottom-up approaches like Living Labs are effective in ensuring digital solutions for citizen centres (Kim & Kim, 2021). A core pillar of all digital transformation efforts is the availability of technological infrastructure and adequate resources (Flechsig et al., 2022; Kurmangali et al., 2024; Shibambu & Ngoepe, 2024). The availability and quality of data are also

indispensable enablers, particularly since technologies like AI are highly dependent on data infrastructure for optimal performance (van Noordt & Tangi, 2023).

Among the major barriers are organizational and cultural challenges. Resistance to change, information hoarding, and sectoral egos are significant hindrances to implementation in many countries (Maulana et al., 2024; Vaccari et al., 2021). Additionally, weak interdepartmental coordination and lack of executive or political support can further stall progress (Flechsig et al., 2022; Shibambu & Ngoepe, 2024; Tangi et al., 2021). Another persistent technical barrier is the presence of legacy systems—obsolete, isolated, and inflexible platforms that hinder interoperability and have been a key factor in the failure of large-scale projects such as the UK's NPfIT initiative (Irani et al., 2023). Human factors also play a central role. Studies indicate that digital skill gaps among civil servants are a major obstacle to technology adoption in the public sector (Barodi & Lalaoui, 2025; Dragan et al., 2024; Rytova et al., 2020).

Digital divides at the societal level represent another significant barrier. Disparities in internet access, device availability, and digital literacy—especially among low-income, elderly, and rural populations—can exacerbate inequalities in access to public services (Alhanatleh et al., 2024; Dragan et al., 2024; Galushi & Malatji, 2022). Finally, the absence of adaptive legal and regulatory frameworks is a substantial barrier. Many governments remain unprepared for the complexities of emerging technologies and lack comprehensive policies on national data privacy, resulting in uncertainty and hindering innovation (Sait & Ali, 2022; Shonhe & Kolobe, 2023; Sobrino-García, 2021; Yeraliyeva et al., 2023).

These factors are highly relevant when viewed in the context of AIS. Digital transformation necessitates that AIS evolve from transactional recording tools to integrated systems capable of providing real-time data for decision-making, transparency, and accountability (Maulana et al., 2024). Supportive leadership, cross-sector collaboration, and skilled human resources are key to AIS modernization, whereas departmental silos, resistance to change, and outdated infrastructure remain critical impediments. As such, AIS transformation is an integral component of successful public sector digital transformation.

Challenges and Opportunities in Digital Implementation in Indonesia

Although most of the reviewed literature on international experiences, the findings offer a relevant framework for mapping the challenges and opportunities of digital transformation in Indonesia. The country stands at a crossroads, possessing immense potential for digital implementation while grappling with entrenched structural barriers. One of the most frequently cited challenges in the Indonesian context is bureaucratic fragmentation and strong sectoral egos. Government institutions, both at the national and subnational levels, tend to operate in silos, leading to issues such as system and application duplication, resource inefficiencies, and low data interoperability. While the implementation of the Electronic-Based Government System (SPBE) framework has promoted integration in various regions, in practice, bureaucracy remains highly fragmented (Maulana et al., 2024). This challenge is exacerbated by the absence of a national-level digital leader with the authority to coordinate cross-

ministerial and institutional agendas (Maulana et al., 2024).

Given its expansive and geographically fragmented archipelagic composition, Indonesia also faces extreme digital inequality. Significant disparities exist in internet infrastructure access, device ownership, and digital literacy between urban areas, especially on Java Island, and outer island regions (Dragan et al., 2024; Maulana et al., 2024; Shibambu & Ngoepe, 2024). This gap presents a major obstacle to equitable SPBE implementation and risks excluding vulnerable populations, thereby widening socio-economic inequalities (Devlin & Coaffee, 2023; Pislaru et al., 2024).

Human resource constraints are another critical issue. There is a clear digital skill gap among civil servants, which hampers the government's ability to effectively manage and deliver digital services (Dragan et al., 2024). The public sector also struggles to attract and retain digital talent, facing stiff competition from the private sector, which provides comparatively more competitive and appealing remuneration schemes (Barodi & Lalaoui, 2025; van Noordt & Tangi, 2023). From a governance perspective, Indonesia's SPBE regulatory framework is often deemed too rigid, emphasising procedural compliance over tangible impact measurement (Maulana et al., 2024).

Successful local government initiatives, such as those in West Java Province, provide replicable models. The Penta helix collaboration framework and the establishment of expert digital units like Jabar Digital Service (JDS) demonstrate that, with strong leadership and innovative institutional models, structural obstacles can be overcome (Maulana et al., 2024). These models have the potential for scalability across other regions and ministries to accelerate the national digital agenda.

One of the most promising opportunities lies in the potential to significantly enhance the quality of public services. Digitalisation can create more efficient, transparent, responsive, and citizen-centred services. Successfully delivering reliable digital services, as highlighted in the literature, can improve citizen satisfaction, restore public trust, and reinforce governmental legitimacy (Irani et al., 2023; Maulana et al., 2024). Moreover, government digital transformation (GDT) can act as a catalyst for economic growth. By fostering a conducive digital ecosystem, enabling open data for innovation, and streamlining bureaucracy, the government can stimulate startups, boost national competitiveness, and unlock new economic opportunities (Jiang et al., 2024; Yeraliyeva et al., 2023). Piddubna et al. (2024) found that in countries like Denmark, Germany, the Netherlands, Finland, and Sweden, digital technologies had a significant positive impact on national economic activities, particularly in the financial sector (Piddubna et al., 2024).

Digital transformation also enhances national resilience in times of crisis. The COVID-19 pandemic highlighted the critical role of digital capabilities in crisis management (Dečman et al., 2022; Zakir Hossain, 2021). Investing in reliable digital infrastructure and services strengthens a country's capacity to withstand future shocks. Finally, digitalisation serves as a key enabler of enhanced transparency, accountability, and long-term sustainability. The digitalisation of functions such as e-procurement and financial management plays a critical role in minimising opportunities for fraud and corruption. In

addition, digital alternatives like e-invoicing support environmental sustainability by decreasing reliance on paper and lowering carbon emissions, thereby advancing progress toward sustainable development objectives (Bojanc et al., 2024).

In summary, Indonesia's digital transformation trajectory is characterised by deeply rooted structural complexities, yet it also presents remarkable strategic prospects. Achieving successful implementation requires drawing lessons from international best practices, expanding the reach of proven local initiatives, designing integrated approaches to overcome digital disparities, and, crucially, fostering a collaborative culture aimed at breaking down entrenched bureaucratic silos that have historically impeded progress.

CONCLUSION

This study comprehensively concludes that digital transformation in public sector Accounting Information Systems (AIS) represents a fundamental paradigm shift, surpassing mere technological adoption. It has evolved from the concept of e-Government, which focused on service provision, into a holistic reform integrating technology into the core strategies and operations of government to create public value (Androniceanu, Georgescu, & Kinnunen, 2022; Dečman et al., 2022; Maulana et al., 2024). Driven by accountability demands from the New Public Management (NPM) paradigm and enabled by technological advancements (Valli Buttow & Weerts, 2022; Zakir Hossain, 2021), this transformation positions AIS not just as a transactional recording tool, but as a crucial enabler of transparent, efficient, and participatory governance (Maulana et al., 2024). Systematic literature analysis shows that successful implementation as exemplified by the Government as a Platform (GaaP) model—relies heavily on the integration of AIS with emerging technologies such as Artificial Intelligence (AI) and the Internet of Things (IoT), as well as the establishment of strong data interoperability to support evidence-based decision-making (Hu et al., 2022; Li et al., 2023; Valli Buttow & Weerts, 2022).

The implementation of digital transformation across various countries demonstrates diverse models and strategies that offer valuable lessons. The GaaP framework, successfully illustrated by Estonia through its X-Road system and the United Kingdom with the GOV.UK platform proves effective in creating integrated digital service ecosystems (Androniceanu, Georgescu, & Sabie, 2022; Seo & Myeong, 2020). Additionally, institutionalization strategies such as establishing dedicated digital units like Jabar Digital Service (JDS) in Indonesia or task forces in Italy play a critical role in accelerating initiatives and dismantling bureaucratic silos (Di Giulio & Vecchi, 2023; Maulana et al., 2024). These successes are also underpinned by collaborative models such as the Penta helix, which engage multiple stakeholders in developing innovative, relevant solutions (Edelmann & Mergel, 2021; Maulana et al., 2024).

The success of this transformation process is influenced by a complex interplay of driving, enabling, and inhibiting factors. Strong political leadership and a clear vision are the most fundamental drivers, providing direction and momentum for change (Di Giulio & Vecchi, 2023; Maulana et al., 2024). These must be supported by coherent policy frameworks, capable institutional

capacities, and adequate technological and data infrastructure (Bojanc et al., 2024; Flechsig et al., 2022; Shibambu & Ngoepe, 2024). However, implementation often faces substantial organizational and cultural challenges, such as resistance to change and entrenched sectoral egos (Maulana et al., 2024; Vaccari et al., 2021). Other critical barriers include outdated legacy systems, digital skill gaps among civil servants, and societal digital divides that risk widening inequalities in public service access (Dragan et al., 2024; Galushi & Malatji, 2022; Rytova et al., 2020).

This study acknowledges several limitations. First, the Systematic Literature Review (SLR) method relied solely on the Scopus database for article identification. This limitation may have excluded relevant studies indexed in other databases such as Web of Science, Google Scholar, or regional repositories. Second, the inclusion criteria restricted the search to English-language articles, potentially introducing geographical and conceptual bias by omitting significant research published in other languages, including Bahasa, which may be highly relevant in the local context. Third, as a literature review, this study is entirely dependent on the quality and scope of previously published studies and does not include primary data collection. Consequently, the depth of analysis on real-world implementation dynamics, particularly those involving cultural and political factors that are often undocumented, remains limited.

Based on these findings and limitations, future research should aim to address the identified gaps. Empirical studies using qualitative approaches, such as comparative case studies of local governments or ministries in Indonesia, are recommended to explore how challenges like sectoral egos and organizational culture are navigated in practice (Maulana et al., 2024). Quantitative research is also necessary to objectively measure the impact of digital transformation on specific performance indicators, such as budget efficiency, public satisfaction, or corruption reduction (Dragan et al., 2024). Further investigation into the effectiveness of collaborative models like Pentahelix and longitudinal studies to assess the sustainability of digital initiatives beyond initial implementation phases a promising area of inquiry (Edelmann & Mergel, 2021; Maulana et al., 2024). Lastly, research focused on developing adaptive regulatory frameworks and cybersecurity risk mitigation strategies tailored to developing country contexts will offer significant practical contributions (Sait & Ali, 2022; Yeraliyeva et al., 2023).

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