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Information Technology Service Capabilities in Supporting Digital Government Transformation Toward Good Governance in Indonesia

Luci Fransiska[1], Puspita Ningrum[2]
[1,2]Department of Public Administration, Faculty of Social and Political Sciences, Universitas Negeri Surabaya
*Corresponding author: 24041715009@mhs.unesa.ac.id

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ABSTRACT

Digital transformation of government has become a strategic agenda in efforts to improve the quality of governance and public services in Indonesia. Although infrastructure development and information technology utilization show positive trends, the implementation of digital government still faces structural challenges, particularly limitations in digital human resource capacity, fragmentation of inter-agency systems, and increasing cybersecurity risks. This study aims to map information technology service capabilities and analyze their relevance as enablers of good governance in the context of Government Technology (GovTech) implementation in Indonesia. The study uses a qualitative approach with a literature review method of national policies, international agency reports, and relevant scientific publications. The results of the study show that the limitations of internal bureaucratic capacity make cooperation between the government and the private sector within the framework of Public Private Partnership (PPP) a crucial strategy. The development of the national information technology service ecosystem, particularly in managed services, cloud computing, system integration, and cybersecurity, provides structural support for strengthening digital government. Information technology service capabilities contribute significantly to improving administrative efficiency, system interoperability, data management transparency, and public service quality. This study confirms that information technology services are not merely supporting instruments, but rather strategic components in realizing adaptive, collaborative, and sustainable digital governance.

1. INTRODUCTION

The rapid development of information technology over the past two decades has fundamentally transformed public sector governance, making digital transformation a strategic priority for improving efficiency, transparency, and accountability in government administration. In this context, digital government and Government Technology (GovTech) have emerged as key approaches to modernizing public service delivery through the integration of advanced technologies such as cloud computing, artificial intelligence, and cybersecurity systems (Piduru, 2022; Hoekstra et al., 2023). These technologies enable governments to enhance operational efficiency, improve data management, and provide more responsive and citizen-centered services. This study focuses on analyzing information technology (IT) service capabilities as strategic enablers of digital government transformation toward good governance in Indonesia, particularly within the GovTech ecosystem. Unlike general studies on e-government, this research emphasizes

the role of IT service providers and their capabilities (e.g., cloud services, cybersecurity, system integration, and managed services) in supporting government digital transformation through collaborative frameworks such as Public-Private Partnerships (PPP). Previous studies have highlighted several important findings regarding digital government transformation. First, digital transformation significantly improves public sector performance by enhancing efficiency, interoperability, and service quality (Paliova, 2025; Niehaves & Klassen, 2024). Second, GovTech has been identified as a more advanced evolution of e-government, emphasizing collaboration between governments and external actors such as startups, private companies, and innovation ecosystems (Karuri-Sebina & Maciko, 2025). Third, the success of digital government is strongly influenced by organizational and technological capabilities, particularly dynamic capabilities in adapting to technological change and managing digital innovation (de Magalhães Santos, 2024). Fourth, public-private partnerships play a crucial role in bridging capability gaps within the public sector, especially in developing countries where governments often lack sufficient digital talent and infrastructure (Zakharkin et al., 2026; Singh, 2025). Finally, digital transformation has been consistently linked to the realization of good governance principles, including transparency, accountability, and citizen participation (Bhanye & Shayamunda, 2025; Eremina, 2025).

In the Indonesian context, prior research has mainly focused on policy evaluation, e-government implementation, and digital transformation challenges, such as limited human resource capacity, fragmented systems, and weak inter-agency coordination . Reports from international institutions (e.g., World Bank, OECD) also emphasize the lack of digital competencies and institutional capacity as key barriers to transformation. While these studies provide important insights, they tend to focus primarily on internal government factors, with limited attention to the specific capabilities of IT service providers as external enablers of digital transformation. Therefore, a critical research gap remains. Existing literature has not sufficiently explored how IT service capabilities particularly those provided by national private sector actors contribute structurally and operationally to the GovTech ecosystem and good governance outcomes. Moreover, there is limited empirical and conceptual analysis of how these capabilities can complement government limitations in areas such as system integration, cybersecurity, and digital infrastructure within a collaborative governance framework. To address this gap, this study aims to map and analyze IT service capabilities and examine their role in supporting digital government transformation toward good governance in Indonesia. By focusing on the intersection between GovTech, IT service ecosystems, and public-private collaboration, this research seeks to provide a more comprehensive understanding of digital governance that goes beyond internal bureaucratic perspectives and incorporates the strategic role of external technology actors.

2. METHODS

This study employs a qualitative research approach using a systematic literature review (SLR) to analyze and synthesize concepts, models, and best practices related to Government Technology (GovTech) and information technology service capabilities in supporting digital government transformation. A qualitative literature review approach is appropriate because it enables an in-depth interpretation of theoretical and empirical findings from prior studies and supports the development of a conceptual framework (Kawabata & Camargo, 2023; MacLean & Titah, 2022). This method is also relevant due to the absence of accessible internal empirical data, allowing the study to rely on secondary data sources such as academic publications, policy reports, and institutional documents (Aminah & Saksono, 2021). This study adopts a systematic literature review (SLR) design, a method recognized for its structured, transparent, and replicable procedures in identifying, selecting, and synthesizing relevant scholarly literature (Moher et al., 2009). The

SLR approach is particularly well-suited for mapping an emerging research domain such as GovTech consulting, as it enables rigorous identification, evaluation, and synthesis of existing evidence while reducing bias and enhancing transparency (Tai & Awasthi, 2025) (ScienceDirect) . Data sources encompass international peer-reviewed journal articles indexed in Scopus and other reputable databases, reports from international organizations such as the World Bank and OECD, government policy documents pertaining to digital transformation in Indonesia, and relevant conference proceedings. This multi-source approach reflects established practice in systematic reviews of digital technologies in public administration, where both academic publications and institutional reports contribute critical empirical and policy evidence (Sage Journals) (Sienkiewicz-Małyjurek & Zyzak, 2025). Literature search was conducted using academic databases including Google Scholar, Scopus, and institutional repositories. Search terms employed included "digital government," "GovTech," "public-private partnership," "IT service capability," and "good governance." Article selection followed the four-phase framework proposed by Moher et al. (2009) identification, screening, eligibility assessment, and inclusion which constitutes the widely adopted PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol (PubMed) . Three inclusion criteria were applied: (1) publication within the 2020–2025 timeframe to ensure recency; (2) direct relevance to digital government, GovTech, or IT service delivery in the public sector; and (3) empirical or conceptual studies demonstrating clear methodological rigor. Articles that fell outside the research focus or lacked sufficient academic credibility were excluded. This procedure is consistent with rigorous systematic review standards applied in public administration research, which require transparent and structured procedures for study identification, screening, eligibility, and final inclusion (Taylor & Francis Online) (Suharmana, 2025; Nguar, 2022; Werang et al., 2025).

The collected literature was analyzed through qualitative content analysis, drawing on the interactive model of Miles, Huberman, and Saldaña (2014), which structures the analytical process into three main stages: data reduction, data display, and conclusion drawing (ResearchGate) . Data reduction involves selecting and simplifying data through coding, finding themes, and clustering, which provides a useful starting point for finding order in qualitative material (IISTE) (Huberman & Miles, 1994). In the data display stage, findings were organized into thematic groups and mapped according to conceptual relationships, since display understood as a visual or organized format presenting information systematically enables more careful comparisons, detection of differences, and identification of patterns and themes (Umd) (Miles et al., 2014). The research was conducted through five sequential stages. First, research problems and objectives were identified by mapping gaps in the GovTech and digital government literature as they relate to the Indonesian public sector context. Second, a systematic search and selection of literature was carried out in line with PRISMA procedures, applying the inclusion and exclusion criteria described above. Third, key themes were classified and coded using qualitative content analysis techniques. Fourth, findings were synthesized and research gaps were identified through pattern analysis and thematic triangulation, consistent with systematic literature review approaches that structure growing bodies of empirical evidence on digitally-induced change in public administration by providing evidence on drivers, implementation processes, and outcomes (Taylor & Francis Online) (Kuhlnis et al., 2023). Fifth and finally, a conceptual GovTech consulting framework was developed, integrating theoretical propositions derived from the reviewed literature to address the identified gaps.

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3. RESULTS AND DISCUSSION

Limitations of Digital Human Resource Capacity in Digital Government Transformation

Policy reports indicate that limited human resource (HR) capacity with digital competencies is one of the most significant obstacles to digital government transformation in Indonesia. Various international studies and reports confirm the existence of a large gap between the government's digital needs and the number of practitioners with adequate expertise, both in the public sector and nationally. According to an OECD report, fewer than 1 in 400 Indonesian government employees possesses the professional digital expertise required, such as for functional positions like Computer Technician (Pranata Komputer / Prakom), and many of these positions are difficult to fill due to competition from the private sector, which offers higher compensation to quality digital talent (OECD 2024).

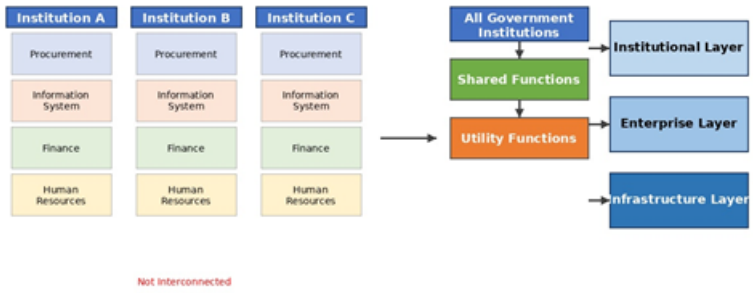

Figure 1. Comparison of Human Resource Capacity and Innovation Between Indonesia and OECD Countries

Source: OECD, 2024

The OECD data above reveals a significant gap between Indonesia and OECD countries in terms of higher education and research spending. Indonesia's higher education attainment rate is only 13.1 percent, well below the OECD average of 41 percent. Likewise, Indonesia's research and development spending remains at 0.3 percent of GDP, reflecting limited national innovation capacity. This situation directly affects the availability of information technology experts in the public sector and reinforces the need for collaboration with the private sector to support digital government transformation. More broadly in Indonesia's labor market, fewer than 1% of workers have advanced digital skills, while only around 19% have basic digital skills and 6% have intermediate skills (SMERU, Oxford, and UNESCA 2022). This shows that, in general, the availability of human resources with high digital competencies is still very low in Indonesia, which directly impacts the ability of government institutions to manage and optimize complex digital systems. This gap is also evident in the government's own efforts to recruit digital talent into the civil service. For example, the Ministry of Administrative and Bureaucratic Reform (PANRB) noted plans to fill tens of thousands of digital talent positions in 2024, including in the Nusantara Capital City and regional governments, but the recruitment process faces major challenges related to insufficient qualifications among applicants. Many of the required IT experts lack the appropriate educational background, making it difficult to fill positions with truly competent personnel (Kompas 2022). Limited digital human resources significantly affect the quality of planning and implementation of government digital systems. In many cases, the number of government employees with technical capabilities, such as cybersecurity and cross-agency system integration, is insufficient to meet the complexity of the systems being built (Al-ma'aitah 2022). This results in the design and operation of government digital systems not running optimally, often creating heavy dependence on external partners for certain technical aspects (Ramim and Hueca

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2021). Ideal digital transformation does not focus solely on hardware and software, but also requires strengthening institutional capacity and developing HR capabilities within the bureaucracy (Gusman 2024). The government's ability to manage digital transformation is part of the administrative capacity essential for achieving good governance. Limitations in digital HR are not only a technical constraint, but are also related to accountability, service effectiveness, and responsiveness in delivering digital public services. A shortage of digital human resources has the potential to cause slow data-driven decision-making, increased risk of operational errors, and excessive dependence on outside parties without strong oversight mechanisms.

The Need for Government Cooperation with the Private Sector in Strengthening Digital Capabilities

Private companies in the field of information technology (IT) have a business framework that is structurally designed to promote continuous innovation, operational efficiency, and speed of technology adaptation. Unlike public sector organizations that are constrained by bureaucratic procedures and strict regulations, IT companies operate in a competitive market environment, requiring them to continually invest in research and development (R&D), digital talent development, and ongoing technology updates (Oliveira-Dias et al. 2022). Strengthening government digital capabilities fundamentally rests on the availability of adequate ICT human resources, both in terms of quantity and competency. However, empirical data shows that the internal capacity of Indonesia's bureaucracy in the ICT field is still very limited. Based on data from the State Civil Service Agency (BKN, 2022), the number of civil servants (ASN) in the ICT job family is only 10,338 people, or approximately 0.24% of the total functional ASN of nearly 3.9 million (BKN, 2022). This proportion is very small compared to the magnitude of the digital government transformation agenda currently underway. This numerical limitation is compounded by several structural factors. First, the public sector is relatively unattractive to ICT professionals due to bureaucratic rigidity, limited work flexibility, and remuneration gaps compared to the private sector. Second, the ASN selection mechanism for ICT roles is known to be very strict and difficult, even for graduates with educational backgrounds in information technology. Third, the low dissemination of information about the needs and specifications of ICT roles in ASN recruitment further narrows the pool of potential candidates.

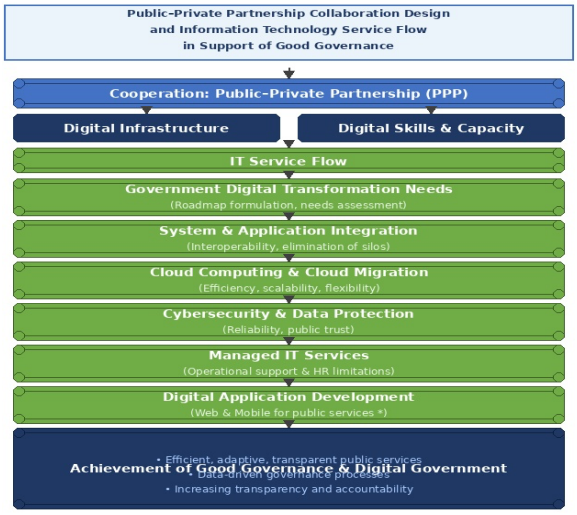

Figure 2. Transformation from a Sector-Based to an Integrated Electronic Government Approach

Source: adapted from UN, 2008; and Ministry of PANRB, 2018

The shortage of ICT human resources also has a direct impact on e-government governance. The implementation of government digital systems in Indonesia is still characterized by fragmentation and a silo mentality among agencies. A clear example can be seen in the use of the SP4N-Lapor application, which was nationally designed as a single public complaints channel, but in practice is still accompanied by separate reporting systems in each ministry and regional government. This situation demonstrates weak coordination, integration, and compliance with the common governance framework. The government has actually responded to this challenge through the development of a national e-government Enterprise Architecture (EA), as regulated by Minister of PANRB Decree Number 255 of 2022. This EA encompasses six main domains: business processes, services, data and information, applications, infrastructure, and security. Additionally, the One Data Indonesia and One Map policies are also aimed at strengthening interoperability and data consistency across sectors. However, the absence of operational technical interoperability regulations and the shortage of ICT human resources hamper the optimal implementation of these policies. Efforts to meet digital HR needs through ASN channels also face structural limitations. Whether through CPNS or PPPK, the recruitment process is centralized, time-consuming, and insufficiently responsive to urgent organizational needs. Moreover, PPPK and individual consultants tend to be short-term and do not yet guarantee knowledge continuity within the organization.

Table 1. Comparison of Digital Skills Recruitment Channels in the Public Sector

Scheme	Advantages	Disadvantages
CPNS (Permanent Civil Servant)	Permanent, knowledge continuity	Long process, less attractive to ICT professionals
PPPK (Contract Civil Servant)	More flexible	Not sustainable, limited knowledge transfer
Individual Consultants	Flexible, fast	High cost, dependency
Private Vendors	Guaranteed quality	Dependency risk, minimal knowledge transfer

Source: SMERU Research Institute, 2024

Compared to the public sector, digital transformation in the private sector started earlier and occurred at a faster pace. The private sector has been using new technology in its organizations and business processes to win fierce market competition. This means that private companies understand how to meet their digital skills needs. With much higher salaries, people with the best digital skills will prefer to work in the private sector, such as for unicorn companies or social media or gaming companies, rather than in the public sector. Kinsey (2018) argues that lack of funding is one of the challenges the public sector must face, and this problem causes a talent deficit in that sector. A McKinsey survey of 28 EU countries revealed an estimated deficit of 8.6 million individuals by 2023, comprising 1.7 million in technology skills, 3.2 million in digital citizenship skills, and 3.7 million in classical skills to fully implement e-government (Daub et al., 2020). In this context, mapping the capabilities of national IT companies is important for assessing the extent to which the domestic private sector can contribute to strengthening digital government transformation in a sovereign and sustainable manner. Cooperation with the private sector needs to be designed within a clear and accountable governance framework. The government must maintain its strategic role as the controller of policy direction, the setter of interoperability standards, and the guarantor of data protection and public interests. Within this framework, the private sector serves

as a technical enabler and innovator, not as a replacement for state functions. Cooperation mechanisms must be directed not only toward the provision of services and technology, but also toward knowledge transfer, strengthening ASN capacity, and long-term system sustainability.

Information Technology Service Capabilities as an Enabler of Good Governance

Broader and deeper digitalization has the potential to accelerate national economic growth and support the achievement of the Indonesia Emas 2045 (Golden Indonesia 2045) vision, as outlined in the 2025-2045 National Long-Term Development Plan (RPJPN). The Asian Development Bank (2022) even estimates that the expansion of the digital economy could contribute up to 11% to Indonesia's Gross Domestic Product over the next two decades. In the context of good governance, integrated and sustainable information technology service capabilities are a primary prerequisite for achieving transparency in administrative processes, accountability in public data management, and the effectiveness of services to the public. At the macro level, the development of the IT services market in Indonesia shows that this sector has grown into a mature and relevant ecosystem to support the digital governance agenda. The Indonesia IT Services Market Analysis notes that the value of the Indonesian IT services market reached USD 4.83 billion in 2025 and is projected to increase to USD 8.55 billion by 2030, with an annual growth rate of 12.11%. This growth is driven by national policies such as Making Indonesia 4.0 and the Golden Indonesia 2045 Vision, increased digital infrastructure investment, and the growing need of organizations, including government agencies, for digital systems that are secure, integrated, and sustainable. This situation shows that IT services are no longer merely supportive, but have become a structural component in public sector governance.

Table 2. Structure and Trends in the Information Technology Services Market in Indonesia

Analysis Dimension	Main Category	Achievement / Projection
Service Type	IT outsourcing & managed services	33.6% market share (2024)
	Cloud services & SaaS	Projected CAGR 14.3% (2025-2030)
Company Scale	Large enterprises	64.3% revenue share (2024)
	SMEs	Projected CAGR 15.2% through 2030
Industry Sector	BFSI (banking & financial services)	28.7% market share (2024)
	Retail & e-commerce	Fastest-growing, CAGR 14%
Deployment Model	Cloud	54.6% market share (2024)
	Hybrid cloud	Projected CAGR 15% through 2030
Key Technologies	Cloud computing	39.4% revenue contribution (2024)
	Artificial Intelligence & Machine Learning	Projected CAGR 14.8% through 2030

Source: Mordor Intelligence, 2025

From the perspective of service types, the dominance of IT outsourcing and managed services, which control approximately 33.6% of Indonesia's IT services market share in 2024, is relevant in the governance context. This service model enables government agencies to manage digital systems sustainably without being fully dependent on the availability of internal human resources, which is often limited (Mordor Intelligence Research & Advisory 2025). In this context, the presence of national information technology companies with end-to-end capabilities is an important factor in supporting the digital transformation of the public sector. These capabilities are concretely reflected in the practices of national information technology companies such as PT Datacomm Diangraha. As an IT company with a business-to-business (B2B) business model, PT Datacomm Diangraha provides services covering the design, development, and maintenance of network and application systems, with specialization in network infrastructure, network security, network management, and applications. Datacomm's customer portfolio encompassing the telecommunications sector, regional governments, and the defense sector shows that the company operates in an environment that demands high levels of reliability, security, and regulatory compliance, characteristics identical to the requirements of digital government systems (Naufalia, Armandiva Usman, and Lateefa 2021). Furthermore, the development of cloud computing, which has dominated 54.6% of Indonesia's IT services market share in 2024, demonstrates a shift toward more flexible and integrated digital infrastructure. Cloud and Software as a Service (SaaS) enable government agencies to improve the scalability of public services, accelerate inter-system interoperability, and optimize budget utilization (Younus et al. 2024). Cybersecurity is also an important dimension in digital good governance. The government's increasing dependence on digital systems amplifies the risks of data breaches, service disruptions, and cyber attacks. Therefore, strengthening cybersecurity and protecting public data is not merely technical in nature, but is an integral part of state accountability and efforts to maintain public trust in digital government operations (Thabit et al. 2023). This strengthening is then implemented through the flow of information technology services that begins with the formulation of a roadmap and assessment of digital transformation needs, followed by system and application integration to improve interoperability and eliminate data fragmentation. Leveraging cloud computing, strengthening cybersecurity and data protection, and managed IT services support ensure efficiency, reliability, and sustainability of government digital services. All of these processes culminate in the development of web and mobile-based digital applications oriented toward the needs of the community, thereby promoting improvements in the quality of public services that are more efficient, transparent, and accountable. Thus, IT service capabilities serve as the primary enabler in realizing adaptive and sustainable digital governance through government and private sector collaboration.

4. CONCLUSION

Digital government transformation in Indonesia is an important prerequisite for the realization of effective, transparent, and accountable governance. Although achievements in infrastructure and the use of information technology continue to improve, the main obstacles to digital transformation still lie in the limited digital human resource capacity in the public sector and the fragmentation of digital government systems. The results of the study indicate that these limitations cannot be fully overcome through internal bureaucratic mechanisms, making government cooperation with the private sector within a Public-Private Partnership (PPP) framework a relevant and strategic approach. The increasingly mature development of the information technology services market in Indonesia, particularly in managed services, cloud computing, and cybersecurity, provides a supporting ecosystem for strengthening digital

government. In this context, national information technology companies have the capability to serve as technical enablers in system integration, digital infrastructure management, and the strengthening of public data security. This study confirms that information technology service capabilities are no longer complementary in nature, but have become a structural component in the delivery of digital governance. Sustainable IT service integration directly contributes to improving administrative efficiency, data management transparency, and the quality of public services. Thus, digital government transformation oriented toward the principles of good governance requires the design of accountable, sustainable, and institutionally focused public-private collaboration.

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