

Advancing Public Service Quality through Indonesia's Electronic-Based Government System

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Article Info	ABSTRACT
<p>Keywords: Electronic-Based Government System (SPBE) Public service quality Digital divide Cybersecurity Governance reform</p>	<p>Indonesia's Electronic-Based Government System (SPBE) has emerged as a transformative framework for enhancing public service quality through digital governance. This study examines SPBE's role in improving efficiency, transparency, and accessibility by analyzing its implementation across four domains: governance, management, services, and infrastructure. Despite progress reflected in Indonesia's improved SPBE Index (3.12 in 2024) and global e-government rankings, challenges such as the digital divide (2,881 villages lack internet access), low civil servant digital literacy (30%), cybersecurity threats (400 million attacks in 2023), and system fragmentation (24,000 unintegrated applications) hinder optimal outcomes. The research employs a literature review and bibliometric analysis of 533 studies, identifying six thematic clusters that highlight SPBE's structural foundations, service quality impacts, and regional disparities. Findings reveal that while SPBE streamlines workflows through unified portals like the Public Service Portal, inconsistencies in infrastructure maintenance, user interface design, and cross-agency integration persist. The SERVQUAL model (Zeithaml et al., 1985) underscores gaps in reliability, responsiveness, and empathy, particularly for rural and digitally excluded populations. Policy recommendations include targeted infrastructure development, tiered digital training programs, security-by-design adoption, and centralized data governance to address fragmentation. The study concludes that SPBE's success depends on bridging implementation gaps through institutional reinforcement, equitable resource distribution, and continuous evaluation, positioning it as a catalyst for Indonesia's bureaucratic reform and inclusive digital transformation.</p>
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INTRODUCTION

The effectiveness of governance is fundamentally determined by the quality of public services delivered to its citizens. In the modern era, the quality of public service delivery is assessed not only by its physical availability but also by the government's capacity to leverage digital technologies to simplify administrative procedures, improve transparency, and expand access for all societal segments (Heeks, 2006). Information and Communication Technology (ICT) plays an essential role in societal life, with its development contributing significantly to

enhancing the effectiveness and efficiency of governmental systems and positively influencing public service improvement (Utami, Khairi, & Sartika, 2024). In response to these developments, the Government of Indonesia initiated the Electronic-Based Government System (Sistem Pemerintahan Berbasis Elektronik) as an integrated policy framework aimed at strengthening the effectiveness, efficiency, transparency, and accountability of governance.

To institutionalize digital government practices, the government enacted Presidential Regulation Number 95 of 2018 on SPBE, which serves as the legal foundation for its implementation. This regulation mandates the provision of integrated electronic government services between central and regional agencies through the adoption of effective digital technologies to minimize the potential for maladministration, reduce lengthy bureaucratic procedures, address remote access barriers, and lower service delivery costs. The implementation of SPBE is expected to accelerate the realization of good governance, strengthen performance accountability among civil servants, and promote cross-sectoral collaboration in government operations.

Progress in SPBE adoption has been reflected in international and national assessments. The United Nations (UN) E-Government Survey in 2024 ranked Indonesia 64th out of 193 countries, marking an improvement of 13 positions compared to its 77th rank in 2022. At the national level, the SPBE Index in 2024 recorded a score of 3.12, categorized as “good” according to Decree of the Minister of State Apparatus Utilization and Bureaucratic Reform (PANRB) Number 663 of 2024, which evaluated 615 central and regional government institutions. This represented an increase from the 2023 score of 2.34, categorized as “fair,” and indicates the government’s consistent commitment to improving the implementation of SPBE in Indonesia.

The evaluation of SPBE is guided by Ministerial Regulation Number 59 of 2020 concerning SPBE Monitoring and Evaluation, as well as Ministerial Guideline Number 3 of 2024, which details procedures for SPBE evaluation. These frameworks utilize 47 assessment indicators across four domains, namely policy, governance, management, and services. The evaluation aims not only to measure the quality of SPBE implementation at both central and regional government levels but also to assess the improvement of integrated, digital-based public services.

Despite the progress achieved, the nationwide implementation of SPBE continues to face significant challenges. These include limited digital infrastructure in certain regions, disparities in technological literacy between government officials and citizens, suboptimal data integration between institutions, and resistance to changes in bureaucratic work culture. Moreover, public satisfaction with digital public services remains uneven, particularly in areas with limited internet connectivity.

From a theoretical perspective, David Ronfeldt (1996) posits that in the digital era, governmental power and legitimacy will shift from traditional bureaucracy toward information-based governance. He argues that authority will increasingly be derived from flexible, network-oriented systems rather than solely from hierarchical structures. In line with this, Richard Heeks (1996) defines e-government as “the use of information and

communication technologies (ICTs) to improve the activities of public sector organizations.” This perspective emphasizes that the adoption of ICT by government agencies should not merely digitize procedures but also transform bureaucratic performance toward greater efficiency, effectiveness, and citizen participation. Heeks highlights the importance of addressing the design–reality gap the mismatch between system design and field realities and identifies several success factors, including adequate ICT infrastructure, the capacity of human resources, and system compatibility with local needs.

According to Presidential Regulation Number 95 of 2018, SPBE consists of four main domains. The governance domain covers strategic planning, risk management, and supportive regulations. The management domain includes ICT infrastructure management, information security, and data management. The service domain encompasses electronic-based administrative and public services. The infrastructure domain covers the national data center, intra-government networks, and government service connectors. When effectively implemented, these four domains are expected to improve public service quality, which can be measured through indicators such as efficiency, transparency, and accessibility. Thus, the role of SPBE can be analyzed as a causal relationship between the implementation of its domains and improvements in public service delivery.

Zeithaml, Parasuraman, and Berry (1985) define service quality as the customer’s perception of how well the service received meets or exceeds their expectations (perceived service quality). They propose five dimensions of service quality, known as the SERVQUAL model. Tangibles refer to the physical appearance of facilities, equipment, personnel, and communication media, which in the context of SPBE may include user-friendly and informative service portals. Reliability measures the ability to deliver promised services consistently, accurately, and on time, as reflected in error-free systems, accurate applicant data, and timely service outcomes. Responsiveness assesses the willingness and speed of service providers in assisting customers, providing information, and addressing complaints, which can be facilitated by responsive chatbots or live chat features on public service websites. Assurance relates to the knowledge, competence, courtesy, and credibility of service providers, supported by robust data security systems, cybersecurity certifications, and clear standard operating procedures. Empathy reflects the level of care and personal attention given to service users, such as the provision of accessibility features like large fonts or audio readers for visually impaired individuals.

In this context, the role of SPBE in enhancing public service quality should be viewed as a strategic instrument for governmental transformation that integrates information technology, digital governance, and service innovation to achieve an efficient, transparent, accountable, and citizen-responsive bureaucracy. SPBE serves as a catalyst for bureaucratic reform, where its successful implementation will significantly influence public trust in government institutions.

METHODS

This study adopts a literature review and bibliometric analysis approach, as the topic of the Electronic-Based Government System (EBGS) is multidimensional and continually evolving.

This methodological choice enables the authors to identify, evaluate, and synthesize a wide range of scholarly sources, regulatory frameworks, and policy reports relevant to the subject matter. The literature review facilitates an in-depth examination of theoretical models related to digital government, bureaucratic effectiveness, and public service quality. Through the analysis of existing literature, the study traces the development of EBGs policy in Indonesia, from its initial regulatory foundations to the subsequent evaluations of public service delivery.

The first stage involves source identification, in which the authors will employ keywords such as “Electronic-Based Government System,” “EBGS,” “digital government,” “quality improvement,” and “public service” to retrieve peer-reviewed journal articles, books, government reports, and pertinent regulatory documents published between 2022 and 2024, applying bibliometric techniques using VOSviewer for simulation. The second stage consists of a critical evaluation of these sources. The authors will assess the credibility and relevance of each source, a process essential to ensuring that the data used in the analysis are scientifically valid and reliable.

The subsequent stage of the literature review is synthesis, whereby the authors will summarize and categorize findings from diverse sources into a coherent framework. This synthesis not only compiles various definitions and conceptualizations but also compares prior research findings on EBGs implementation across different regions, including the challenges encountered and its positive and negative impacts on public service delivery. By juxtaposing these findings, the study aims to provide a holistic and nuanced analysis. The synthesis outcomes will form the central argument of the research, namely, that EBGs plays a pivotal role in enhancing the quality of public services in Indonesia. In doing so, this research seeks to construct a robust conceptual framework for analyzing how EBGs can serve as a strategic instrument in realizing an efficient and transparent government

RESULTS AND DISCUSSION

Following the process of keyword and phrase selection based on thematic relevance, the analysis identified 23 research topics, which were subsequently grouped into six clusters derived from 173 studies out of a total of 533 research samples. These 23 topics form the primary focus of this study and serve as the conceptual foundation for examining the role of the Electronic-Based Government System (SPBE) in improving public service delivery in Indonesia. The analytical framework employed in this study examines the interrelationships between clusters, the degree of novelty of the research (based on publication years), and the saturation of each thematic focus.

Table 1. Clusters and Research Topics on SPBE in Public Service Delivery

Kluster 1 (6 topics) Enterprise system architecture; SPBE implementation; SPBE index; SPBE adoption; SPBE framework; SPBE policy	Kluster 2 (4 topics) E-government; Public service quality; Quality improvement; Role of e- government	Kluster 3 (3 topics) Analysis; Service delivery; SPBE users
Kluster 4 (4 topics)	Kluster 5 (3 topics)	Kluster 6 (3 topics)

Regional government; SPBE implementation in local contexts; SPBE impact; Role of SPBE	Public services; Service delivery performance; Service role	Indonesia; Systems; Digital transformation
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Source: Processed from VOSviewer analysis (2025)

The distribution of topics across clusters reveals that Cluster 1, which encompasses themes such as enterprise system architecture, SPBE implementation, and the SPBE index, is the most extensive in scope. Its broad thematic coverage suggests that much of the current scholarly discussion in Indonesia is centered on the foundational and structural aspects of SPBE. This is consistent with global e-government research, where the initial phases of digital governance transformation often prioritize system architecture, policy frameworks, and implementation strategies (Criado & Gil-García, 2023; United Nations, 2024).

Cluster 2 focuses on e-government in relation to service quality and its improvement, emphasizing the user-centric perspective of SPBE. Studies in this cluster typically assess how digital governance initiatives impact citizen satisfaction and trust in public institutions, aligning with findings in broader digital transformation literature that highlight perceived quality and accessibility as determinants of adoption (Alzahrani et al., 2023; Park & Kim, 2022).

Cluster 3 addresses analytical approaches, service processes, and the experiences of SPBE users. This thematic grouping reflects a methodological shift toward measuring the effectiveness of SPBE from the standpoint of end-users, incorporating both qualitative and quantitative service performance indicators. Cluster 4, by contrast, is regionally focused, exploring how SPBE is implemented in local government contexts, the extent of its influence, and its operational role in decentralized governance structures. Such studies often reveal disparities in capacity and adoption rates between urban and rural areas, a challenge noted in other developing countries undergoing digital governance transitions (Janssen et al., 2022).

Cluster 5 concentrates on the operational dimensions of public service delivery, including performance evaluation and role definition. This cluster's narrower focus suggests an emerging research niche that bridges technological implementation with managerial outcomes. Finally, Cluster 6, which includes topics such as Indonesia, systems, and digital transformation, appears more conceptual in nature, often serving as an overarching framework for studies in other clusters. While smaller in size, this cluster connects broader socio-technical transformations with national-level policy discourse, reflecting an awareness that SPBE is part of a wider digital transformation agenda (Kassen, 2023).

The network relationships among these clusters reveal varying degrees of interconnection. Cluster 1 exhibits the highest level of cross-cluster connectivity, indicating that foundational aspects of SPBE architecture and policy serve as common reference points across multiple research domains. Conversely, Cluster 6 demonstrates the lowest degree of connectivity, suggesting that while digital transformation is a prominent theme in national policy, its explicit integration into specific SPBE research domains remains limited. This pattern aligns with observations in comparative digital governance studies, which note that conceptual policy frameworks often precede their operational integration into sector-specific research (Bertot et al., 2021).

Taken together, the thematic mapping of these 23 topics across six clusters provides a structured view of SPBE scholarship in Indonesia. It shows a research landscape that is still heavily anchored in structural and implementation issues, yet increasingly attentive to service quality, user experiences, and regional adaptation. This progression suggests a maturing discourse that is beginning to move beyond technical deployment toward assessing the broader governance, societal, and developmental implications of SPBE initiatives.

The analysis of thematic relationships between clusters and research topics revealed a structured network of scholarly discourse on the role of the Electronic-Based Government System (SPBE) in improving public service delivery in Indonesia. Each research topic was conceptualized as a node within the network, following the framework described by Van Eck and Waltman (2019). These nodes represent distinct subjects identified in the titles and abstracts of the sampled studies, with their size corresponding to the frequency of occurrence. Larger nodes indicate higher prominence of a topic in the literature, while the connections between nodes represent co-occurrence relationships, where greater link strength reflects stronger conceptual associations.

The mapping identified twenty-three nodes distributed across six clusters, connected by 173 links with a total link strength of 533. This network was constructed from studies retrieved through targeted queries containing terms such as “Sistem Pemerintahan Berbasis Elektronik,” “SPBE,” “digital government,” “quality improvement,” and “public service” using Google Scholar searches processed in Publish or Perish. Topics within the same cluster share a high degree of thematic similarity, with Cluster 1 emerging as the most dominant, containing frequently studied themes and showing strong connections with other clusters. By contrast, Cluster 6 displayed the lowest degree of connectivity, suggesting its topics are less integrated within the broader SPBE research landscape.

The temporal dimension of the analysis highlights the novelty of research in this domain. The most intensive period of scholarly activity occurred between 2022 and 2024, marking a significant expansion of studies focusing on the operationalization and societal impact of SPBE. Earlier research, prior to 2022, primarily addressed conceptual frameworks and foundational implementation issues. More recent works have shifted toward performance evaluation, user experience, and service quality enhancement, a transition consistent with international digital governance trends (Criado et al., 2023; Janssen et al., 2022; Matheus et al., 2021). This evolution indicates a maturing research agenda in which theoretical propositions are increasingly tested through applied and impact-oriented studies.

In parallel, the density analysis provided insights into the level of research saturation for each topic. Highly saturated topics—those with dense interconnections and extensive prior exploration—include the general implementation of SPBE, measurement via the SPBE index, and its broad role in governance. These topics, while foundational, are approaching a point where additional research yields diminishing novelty. Conversely, low-density topics such as the impact of SPBE on specific public service domains, user interaction patterns, and the influence of regional adoption disparities remain underexplored. These areas present considerable opportunities for future inquiry and align with calls from recent literature to

investigate the localized and human-centered dimensions of digital transformation (Gil-García et al., 2020; Kassen, 2023; Zuiderwijk et al., 2021).

Overall, the integration of thematic mapping, temporal novelty assessment, and saturation analysis offers a comprehensive understanding of SPBE scholarship in Indonesia. The findings suggest that while the field is anchored in a few dominant themes, there remain strategically important gaps that could advance both academic theory and policy-making. Addressing these gaps—particularly through studies that examine user experience, regional governance challenges, and measurable public value outcomes—could significantly enrich the knowledge base and enhance the practical implementation of SPBE in line with evolving digital governance paradigms worldwide.

The core domains of the Electronic-Based Government System (Sistem Pemerintahan Berbasis Elektronik, SPBE) in Indonesia constitute interdependent pillars designed to ensure that SPBE operates comprehensively and in an integrated manner, in accordance with Presidential Regulation No. 95 of 2018. These domains are as follows. First, SPBE Governance in Indonesia is already “good on paper” as it is supported by adequate regulations, institutional structures, and evaluation instruments. However, in terms of practice and field outcomes, significant gaps remain, particularly in the areas of infrastructure equity, data integration, cybersecurity, and the enhancement of human resource capacity. Indonesia is currently in a transitional phase, moving from “having a system” to “having a system that is effective, secure, and inclusive.”

Second, SPBE Management has a solid foundation but its implementation remains uneven and not fully effective. Indonesia is still in the phase of “building the foundation while testing its resilience,” and has yet to reach the “fully mature operational” stage observed in countries with well-established e-government ecosystems. Third, SPBE Services are on the right track, as indicated by the growing number and variety of digital services and efforts toward national integration through GovTech initiatives and the National Data Center. Nevertheless, to be considered truly effective and equitable, full cross-agency integration is required so that citizens can access services through a single gateway. Additional improvements are also needed in terms of system speed, reliability, and the inclusive design of services for all societal groups. Fourth, SPBE Infrastructure in Indonesia has been developed but is insufficiently maintained or updated, leaving it vulnerable to cyberattacks and data breaches. This domain forms the backbone that ensures the connectivity and availability of digital services. Critical infrastructure elements include the National Data Center (PDN), the Government Intranet, and the Government Service Connectivity System. The PDN functions as an integrated data storage hub, while the Government Intranet ensures smooth communication between agencies. With robust and integrated infrastructure, all SPBE services can operate reliably and securely across Indonesia.

From the literature, the role of SPBE in improving the quality of public services in Indonesia can be examined through several dimensions. The first dimension is efficiency. SPBE has the potential to deliver highly efficient public services, but this depends on consistent implementation. If infrastructure is evenly distributed, data is integrated, and human resources are sufficiently skilled, efficiency gains can be substantial in terms of speed,

cost, and transparency. The National SPBE Architecture integrates previously siloed systems and applications across ministries, agencies, and regional governments. Through unified portals, such as the Public Service Portal, duplication of data and workflows is minimized. Digital workflows accelerate administrative processes, save time, and reduce paper use, allowing civil servants to focus on more strategic tasks while the public receives faster services.

The second dimension is transparency. Electronic-based government services provide easy access for citizens, enabling public oversight of government policies and services. Digital workflows generate accountability because each stage of the process is recorded electronically, making manipulation difficult and reducing opportunities for illicit practices. The third dimension is accessibility. SPBE reduces geographical barriers, enabling citizens in remote areas to access government services via mobile devices or computers with internet connectivity. This promotes equitable service delivery and reduces disparities between regions. Comprehensive SPBE implementation would lead to more efficient processes, a transparent and accountable environment, and broader service coverage accessible to all citizens.

Quality of Public Services in Indonesia

Evaluation and case studies indicate that SPBE implementation has not fully met the five indicators of public service quality. While notable improvements have occurred, disparities persist across agencies and regions. For tangibles, many government agencies now provide modern applications, web portals, and data centers, with user interfaces that enhance professionalism and technological adaptability. However, application design quality remains inconsistent, with some systems poorly integrated or insufficiently maintained. For reliability, some strategic services such as tax payment systems and population administration have achieved high operational reliability, reducing human error and ensuring data accuracy. Yet, infrastructure weaknesses, particularly in rural areas, cause technical disruptions, and data duplication across systems undermines trust. For responsiveness, online licensing and complaint systems have reduced processing times, and platforms like LAPOR! enable quicker responses. Nonetheless, rapid acknowledgment does not always translate into substantive problem resolution, and response speed varies widely. For assurance, measures such as electronic signatures and digital certificates provide legal guarantees, supported by the Personal Data Protection Law (UU PDP). However, cybersecurity incidents, including data breaches, reveal gaps in consistent security implementation. For empathy, some services cater to vulnerable groups and offer guidance features, reflecting efforts to meet diverse needs. Yet, many systems still lack personalization, and low digital literacy among certain populations hinders service inclusivity.

Challenges in SPBE Implementation in Indonesia

Several complex challenges hinder the optimal implementation of SPBE.

The first is the digital divide. In 2023, approximately 72 percent of the population had access to internet services at speeds suitable for electronic government operations, yet 2,881 villages had no internet access at all (Ministry of Villages, Development of Disadvantaged Regions, and Transmigration, 2023). This divide reflects unequal infrastructure distribution,

limited access to devices, and relatively high connectivity costs, undermining inclusivity and efficiency goals. Addressing this requires multi-dimensional strategies, including targeted infrastructure development, public access points, device subsidies, offline-compatible services, and user-friendly multilingual interfaces.

The second challenge is human resource capacity. Only about 30 percent of civil servants are digitally literate, with 40 percent unprepared to operate SPBE systems effectively (BKN, 2024). High turnover among trained IT staff disrupts capacity-building efforts. Overcoming this requires a national digital competency framework for the bureaucracy, tiered training programs, partnerships with academia and industry, and retention incentives for key talent.

The third is cybersecurity. In 2023, the National Cyber and Encryption Agency (BSSN) recorded 400 million cyberattacks. Many institutions still operate legacy systems with weak configurations and limited incident response capabilities. Addressing this requires adopting security-by-design principles, implementing national security standards, establishing coordinated Security Operations Centers, conducting regular vulnerability audits, and fostering cybersecurity awareness among staff and citizens.

The fourth challenge is system fragmentation. Over 24,000 government applications and 2,700 data centers exist across agencies, with significant redundancy and poor integration. This results in siloed data, inconsistent definitions, and duplicated functions. Addressing fragmentation requires strong data governance policies, standard metadata definitions, API-first approaches, master data management, gradual migration from legacy systems to open architectures, and incentives for inter-agency collaboration.

In sum, SPBE represents a strategic instrument for advancing public service delivery in Indonesia. However, its success depends on bridging infrastructure gaps, building human resource capacity, enhancing cybersecurity, and integrating fragmented systems. Only through these measures can Indonesia transition from having a system to having a truly effective, secure, and inclusive digital government.

CONCLUSION

The study results show that SPBE plays a transformative and significant role in improving the efficiency, transparency, and accessibility of public services, as reflected in the increasing national SPBE index scores from year to year. Nevertheless, there are still complex challenges, including the digital divide, human resource capacity, cybersecurity, and information system fragmentation. This study recommends strengthening system integration, enhancing the capacity of public officials, and conducting regular data-based evaluations to promote the sustainability of SPBE as the foundation for transforming public services in the digital era.

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