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The Extent of the Maturity of the Implementation of E-Government at the Local Level in Indonesia: A Literature Review Based on SPBE Evaluation

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This study examines the maturity of e-government implementation in Indonesian local governments using a systematic literature review guided by the national Electronic-Based Government System (SPBE) framework. Data sources include peer-reviewed journal articles, SPBE evaluation reports, and the United Nations E-Government Development Index (EGDI) from 2018 to 2024. The findings indicate an improvement in Indonesia's national SPBE score from "fair" (2.34 in 2022) to "good" (2.79 in 2023), accompanied by a remarkable rise in EGDI ranking from 107th (2018) to 64th (2024). Nevertheless, significant disparities persist across regions. Key enablers of progress are regulatory clarity, strong local leadership, continuous capacity-building programs, and cross-sector system integration, while major barriers include inadequate infrastructure, low digital literacy among civil servants, and overlapping regulations. The study contributes to e-government scholarship by explicitly linking local performance variations to the SPBE evaluation domains and provides practical policy implications through a roadmap of competency-based training, data governance, and regulatory harmonization. These findings offer actionable guidance for policymakers to accelerate inclusive digital transformation and achieve the national SPBE "Excellent" target.
Keyword: *E-Government; Local Governance; Public Administration, Implementation SPBE,*

ABSTRAKSI

Penelitian ini menganalisis tingkat kematangan penerapan e-government di pemerintah daerah Indonesia melalui *systematic literature review* berbasis kerangka evaluasi Sistem Pemerintahan Berbasis Elektronik (SPBE). Sumber data mencakup artikel jurnal, laporan evaluasi SPBE nasional, dan survei United Nations E-Government Development Index (EGDI) periode 2018–2024. Hasil kajian menunjukkan adanya peningkatan skor SPBE nasional dari kategori "cukup" (2,34 pada 2022) menjadi "baik" (2,79 pada 2023), sejalan dengan kenaikan peringkat EGDI Indonesia dari posisi 107 (2018) menjadi 64 (2024). Namun, capaian di tingkat lokal masih sangat bervariasi. Empat faktor utama pendorong keberhasilan adalah kejelasan regulasi, kepemimpinan daerah, program peningkatan kapasitas aparatur, dan integrasi aplikasi lintas sektor. Sebaliknya, keterbatasan infrastruktur, rendahnya literasi digital aparatur, serta tumpang tindih regulasi menjadi hambatan dominan. Penelitian ini berkontribusi pada literatur e-government lokal dengan mengaitkan variasi capaian SPBE daerah pada empat domain evaluasi nasional, sekaligus menawarkan rekomendasi strategis berupa pelatihan berbasis kompetensi, penguatan tata kelola data, dan konsolidasi regulasi pusat–daerah. Temuan ini memberikan peta jalan kebijakan yang dapat digunakan pemerintah daerah untuk mempercepat transformasi digital menuju kategori SPBE "Sangat Baik".
Keywords: E-Government; Tata Kelola Daerah; Administrasi Publik, Penerapan, SPBE

INTRODUCTION

Digital transformation through *electronic government (e-government*) is a global agenda in realizing more transparent, participatory, and accountable governance. Globally, the implementation of *e-government* Guided by the maturity model (Joshi & Islam, 2018). The success of government's digital transformation is not only determined by the availability of applications, but also by the ability to change bureaucratic processes and create public value (Chohan et al., 2020). This trend suggests that institutional factors, *Interoperability*, and citizen participation is the key to success (Valdés et al., 2011). However, the Indonesian context shows different dynamics, with disparities between regions that have not been fully resolved within the SPBE framework.

In Indonesia, *e-government* has been prioritized in the bureaucratic reform agenda through strategic regulations such as Presidential Regulation Number 95 of 2018 concerning SPBE and Presidential Regulation Number 132 of 2022 concerning SPBE Architecture. Digital transformation is expected to create a responsive, efficient, and inclusive public service-focused local government (Business et al., 2024).

The main fact of the implementation of e-government is to create a *Good Governance* through the democratization of public administration (Suci Pratiwi, 2020). Local governments at the provincial, district, and city levels in Indonesia are increasingly encouraged to implement the practice *e-government* to improve the quality of public services and transparency. Through *e-government*, local governments can integrate digital technology to facilitate access to services, speed up bureaucracy, and improve administrative systems (Nugraha et al., 2021)

Index *E-Government Development Index* (EGDI) released by the United Nations shows a significant increase in Indonesia from 107th in 2018 to 64th in 2024, signaling progress in digital-based public services. However, these developments have not been fully reflected at the local level. The implementation of e-government in local governments still faces gaps, both in terms of infrastructure, human resource capacity, and service integration.(Nugroho & Purbokusumo, 2020).

As a national instrument, *Electronic-Based Government System* (SPBE) is used to measure the maturity of e-government implementation through four domains: policy, governance, management, and services (KemenPANRB, 2023). The national score increased from the 'adequate' category (2.34 in 2022) to 'good' (2.79 in 2023), but there is a sharp disparity between regions: Bali Province is able to reach the high category, while most districts/cities are still at low levels (KemenPANRB, 2023). Furthermore, based on surveys *United Nations E-Government Development Index (EGDI)*, Indonesia ranked 77th out of 193 countries in 2022, up from 88th position in 2020 (of Economic & Affairs, 2024).

This gap indicates that digital transformation at the local level is not yet running optimally. Differences in infrastructure capacity, human resources, and regulatory support are the main factors that determine the success and delay of implementation (Sari & Winarno, 2012). In addition, limited supervision, inadequate infrastructure, weak coordination between work units, and lack of optimal internalization of norms in policy implementation are also obstacles in building *smart governance* thoroughly (Nugraha, 2020)

Although national indicators show improvement, the disparity in implementation at the local level is still evident due to differences in infrastructure capacity, human resource competence, and cross-OPD governance. A gap in the literature is the **lack of a synthesis that explicitly maps the driver/inhibiting factors into the four SPBE domains** and relates them to regional reach. This study aims to: (1) analyze the achievements and trends of local government SPBE in Indonesia; (2) synthesize the factors of success/failure of implementation in the four domains of SPBE; (3) formulate strategic recommendations that **are measurable** and in line with the SPBE target of 'Excellent'.

This research is expected to contribute to the local *e-government* literature as well as provide a digital policy roadmap that can be a practical reference for local governments in accelerating inclusive and sustainable digital transformation.

RESEARCH METHODS

This study uses a qualitative approach with the systematic literature review (SLR) method. The literature analyzed includes journal articles, official government reports, and SPBE evaluation documents for the 2018–2023 period. The main sources include the United Nations *E-Government Development Index* (EGDI) report, the SPBE evaluation report of the Ministry of PANRB, and empirical studies related to the implementation of e-government at the local level.

The literature review process is carried out through three stages. First **Source Identification** by selecting relevant national and international publications using Google Scholar, Scopus, and official

government portals. Second **Thematic categorization** based on the SPBE evaluation framework (policy, governance, management, and service domains) as well as supporting and inhibiting factors for implementation. Third **Synthesis Analysis**, that is, integrating findings from various literature to derive general patterns, gaps, and strategic recommendations (Scott, 2012).

To strengthen the analysis, this study also **utilizes longitudinal data on EGDI Indonesia (2018–2023)** and the achievement trends of the National SPBE Index (2022–2023). This approach allows for a more comprehensive understanding of the maturity level of e-government, both on a global and national-local scale (Creswell & Poth, 2018).

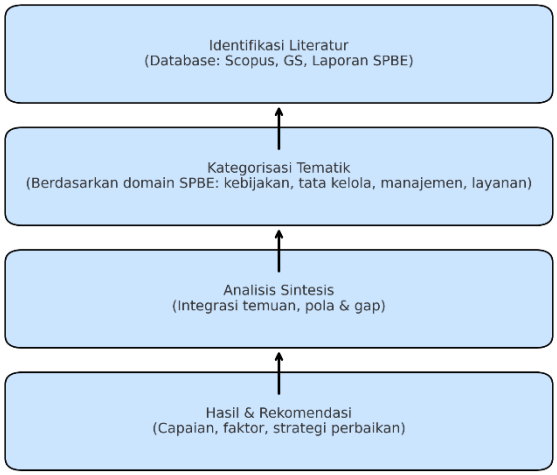

Figure 4. Research Framework of Systematic Literature Review (SLR) Process
Source: Adapted from Scott (2012); Creswell & Poth (2018)

RESULTS AND DISCUSSION

Maturity Level of E-Government Implementation at the Local Level

1. Analysis of the achievements of the SPBE index in local governments.

The results of the SPBE evaluation show an increase in national achievement from a score of 2.34 in 2022 to 2.79 in 2023, which means a shift from the category *enough* to *good* (Ministry of PANRB, 2023). This increase is in line with global trends, where Indonesia's position in the *United Nations E-Government Development Index* (EGDI) also rose significantly from 107th in 2018 to 64th in 2024 (United Nations, 2024). The longitudinal data indicates that there is an improvement in digital governance nationally.(I Made Sukarsa et al., 2020)**.**

Second, at the global level, **Indonesia's E-Government Development Index (EGDI)** shows a significant upward trend, from 107th in 2018 to 64th in 2024, with a score of 0.7991 which places Indonesia in the *Very High EGDI group*. This achievement reflects the strengthening of online services (*Online Service Index*) and human capital (*Human Capital Index*), although telecommunication infrastructure is still relatively lagging behind other ASEAN countries (United Nations Department of Economic and Social Affairs [UN DESA], 2022, 2024).

However, achievements at the regional level show sharp variations. Some regions such as Bali Province managed to achieve high scores thanks to the integration of services and adequate infrastructure support, while districts/cities such as Bangli and Karangasem faced challenges in optimizing digital service systems (Anjani et al., 2019). The cities of Batu and Prabumulih recorded progress in application-based public services, but were still constrained in the aspect of coordination between OPDs (Maris et al., 2y023). Meanwhile, Padang City showed limited progress due to limited human resources and digital literacy of apparatus (Sumijan & Purnama, 2020).

From a theoretical perspective, **model kematangan e-government** emphasized that the increase in the index is not only determined by the availability of the application, but also by **vertical–horizontal integration and organizational business process change**. Outlines the four stages of maturity, namely catalog, transaction, vertical integration, and horizontal integration, with an emphasis on the importance of integration as a characteristic of high maturity (Layne & Lee, 2001). Adding a public value dimension by emphasizing a shift away from service-like *supply-driven* towards a service that creates *public value*

(Andersen & Henriksen, 2006). Highlighting the need for institutional support in the form of standards, data architecture, and change management in accelerating the transition to a mature digital governance (Valdés et al., 2011).

Thus, the practical implications for local governments are the need to focus on **SPBE architecture, data interoperability, strengthening apparatus competence, and ICT infrastructure investment that *closes the last-mile gap***. This is in line with the direction of the national SPBE policy and can accelerate the convergence of regional achievements towards *the Very Good category* (Ministry of PANRB, 2023, 2024; A VILLAGE, 2024).

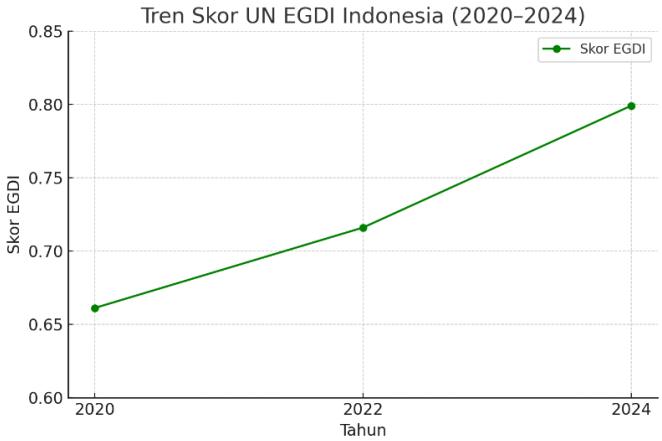

Figure 1. Indonesia's E-Government Development Index (EGDI) Ranking, 2018–2024
Source: United Nations (2024)

This graph shows that Indonesia's position in the *United Nations E-Government Development Index (EGDI)* has increased significantly from 107th in 2018 to 64th in 2024. The increase of 43 ratings indicates the acceleration of the digital transformation of government globally. However, even though the ranking has increased, the challenge of the implementation gap between regions in the country still remains.

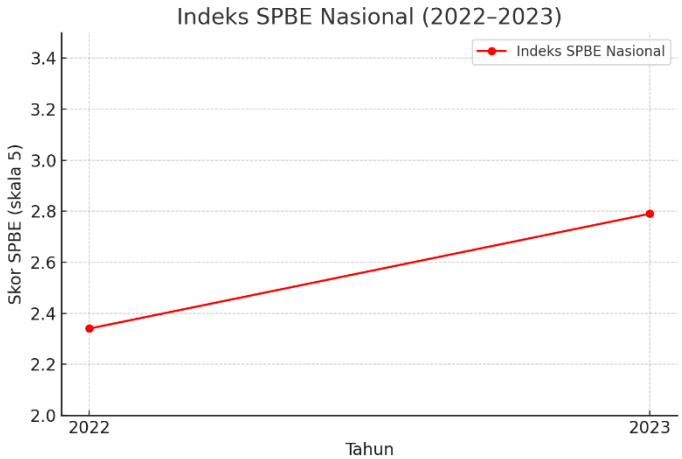

Figure 2. Indonesia's E-Government Development Index (EGDI) Score, 2020–2024
Source: UN DESA (2022, 2024)

Indonesia's EGDI score increased from 0.6612 (2020) to 0.7991 (2024), moving from the category *High EGDI* to *Very High EGDI*. This increase in score shows the strengthening of digital-based public services, especially in terms of *online services* and *human capital*. Nevertheless, the score *telecommunication infrastructure* is still relatively lagging behind other ASEAN countries, so it is an important note in the acceleration of e-government.

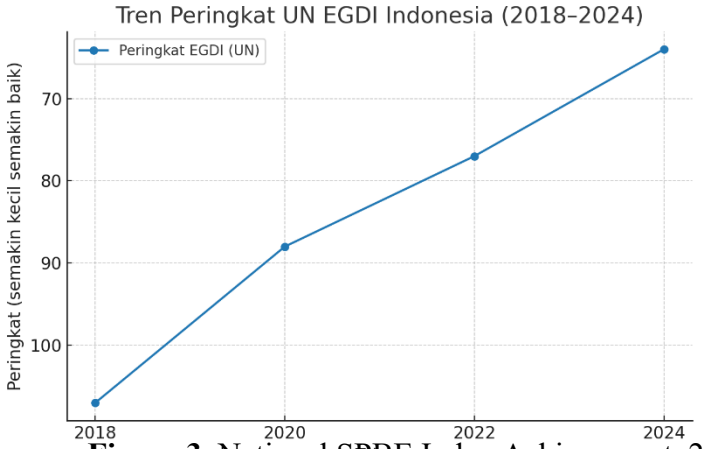

Figure 3. National SPBE Index Achievement, 2022–2023
Source: Ministry of PANRB (2023)

The National SPBE Index measured by the Ministry of PANRB showed an increase from 2.34 (2022, *Adequate* category) to 2.79 (2023, *Good category*). This increase shows an improvement in the quality of SPBE implementation in ministries/institutions and local governments. However, this achievement is still far from the *Very Good level* (≥3.50), so strengthening the digital literacy of the apparatus, system integration, and governance are priorities for improvement.

This difference shows that the level of maturity of e-government in Indonesia is not evenly distributed. Regions with ICT infrastructure support, human resource capacity, and strong leadership tend to be more advanced, while regions with limited resources are still left behind. This confirms that the increasing national achievement does not fully reflect conditions at the local level.

2. Factors Affecting the Success or Failure of Implementation

The implementation of e-government at the regional level is influenced by various interrelated factors. The results of the literature review show that these factors can be categorized into four main dimensions according to the SPBE evaluation framework, namely policies and regulations, institutional governance, management and human resources (HR), and public services and infrastructure (Wulansari & Inayati, 2019).

First, policies and regulations. Clarity of regulations, consistency of policies between the central and regional governments, and the existence of standard operational standards are important requirements in encouraging successful implementation(Figoro et al., 2024). On the other hand, overlapping regulations often hinder the integration of systems in the regions (Pramuditha et al., 2025). This is in line with the framework *public value* that emphasizes the importance of *policy coherence* so that digital services are able to create public value (Moore, 1995).

Second institutional governance. Coordination between regional apparatus organizations (OPD) and the support of regional leaders have proven to play a major role in the success of the digitalization program (Rachmawati & Fitriyanti, 2021). Weak commitment and sectoral egos are often the main obstacles. The international literature also confirms that local leadership determines the direction of digital transformation as it plays a role in budget allocation and policy priorities (Andersen & Henriksen, 2006).

Third, management and human resources. Apparatus capacity, digital literacy, and readiness to adapt to change are key factors (Mellyana Eka Mardiana, Rizki Aulia Adinda, 2021). Regions that have continuous training programs tend to be more successful in implementing digital services (Taufik et al., 2023). On the other hand, change resistance and human resource limitations lead to delays (Gartika & Widiyanto, 2024).

Fourth, public services and infrastructure. The availability of internet networks, cross-sector application integration, and public access to digital services determine the effectiveness of e-government (Astuti et al., 2024). Areas with weak infrastructure tend to face serious obstacles in the provision of technology-based public services. Meanwhile, areas with limited networks still face serious obstacles in the provision of services (Wirawan, 2020). This condition indicates the existence of a digital divide (*digital divide*) which widens the difference in the quality of public services between regions (UN DESA, 2022).

From the cross-study synthesis, there are **three consistent patterns**. First, clear regulations are the main foundation for cross-sector coordination. Second, the digital literacy of the apparatus is the most significant differentiating factor between successful and disadvantaged areas. Third, ICT infrastructure

determines the extent to which public services can be inclusive and equitable. Thus, the successful implementation of e-government at the regional level is not solely a matter of technology, but rather a complex interaction between policies, leadership, bureaucratic capacity, and infrastructure support.

3. Improvement Efforts and Strategic Recommendations

The results show three key approaches to driving adoption *E Government* in Indonesia: (1) that solid national support should be provided for the establishment of Smart City policies, (2) that technological advances should be strategically integrated to encourage effective implementation, and (3) that it is critical to address institutional and human resource barriers that hinder progress (Sulistyaningsih et al., 2023). Digital governance has been seen as a strategy to improve public services, encourage citizen engagement, and modernize government institutions. Despite the recognition of this important role in governance transformation, there has been no consistent evidence on the determinants and outcomes of transformation (Renteria et al., 2019).

Efforts that can be made are by providing intensive assistance to all local governments in the implementation of e-government. Assistance must continue to be carried out so that the village government can implement e-government in realizing good governance (Nugraha, 2022)

First, increasing the capacity of human resources and digital literacy. Apparatus requires ongoing training on information technology, data management, and digital security. Research shows that training programs are able to increase the readiness of apparatus to adopt digital innovations and accelerate the public service transformation process (Ardana, 2022; Nugraha, 2023). In addition, strengthening digital culture in the bureaucracy needs to be carried out so that changes towards electronic-based government are not just an administrative program (Dwiyanto, 2021).

Second, strengthening governance and regulatory integration. Policy synchronization between the central and regional governments is needed to avoid overlapping regulations and encourage the creation of joint operational standards (Sari & Nugroho, 2021). Regional head leadership support has also proven to play a major role in the success of cross-organizational coordination of regional apparatus (Putra & Yanuar, 2022). Policy synchronization between the central and regional governments is needed to avoid overlapping regulations and encourage the creation of joint operational standards (Chohan et al., 2020). Without a strong political commitment, the implementation of SPBE in the regions will be partial and difficult to integrate.

Third, infrastructure development and system interoperability. Equitable distribution of internet networks, improving the quality of data centers, and integrating applications across sectors are important priorities (Ministry of PANRB, 2023). Studies show that areas with adequate ICT infrastructure support are faster to achieve *the "good" SPBE category* than areas with limited networks (Wicaksono & Pratama, 2021). The interoperability of the system between regions and between OPDs must also be strengthened so that public services are more efficient, transparent, and easily accessible to the public (United Nations, 2022).

This recommendation not only supports the National SPBE target to achieve the *"Very Good"* category, but also ensures an inclusive digital transformation throughout Indonesia, so that the gap between regions can be minimized.

CONCLUSION

This study shows that the maturity level of e-government implementation in Indonesian local governments still faces significant challenges despite the increasing trend of SPBE index achievement from year to year. Nationally, the SPBE score is in the "quite good" category, but the gap between regions is still high. Some areas such as Bali Province were able to achieve the "very good" category, while most districts/cities are still at the "adequate" or even "bad" level at the sub-district operational level. This confirms that digital transformation at the local level is not evenly distributed.

The main factors that affect the success of the implementation include the readiness of ICT infrastructure, human resource competence and digital literacy, institutional coordination, regulatory support, and regional leadership commitment. Uneven infrastructure and limited human resources are still the dominant obstacles. On the other hand, regions that have visionary leadership and strong regulatory support tend to be more successful in developing digital public services.

As a strategic step, efforts to strengthen the implementation of e-government need to be focused on three main priorities. First, increasing the technical capacity and digital literacy of human resources of apparatus through continuous mentoring and training. Second, strengthening ICT infrastructure, cybersecurity, and inter-system integration to be able to support public services effectively. Third, encouraging regional leadership and central-regional regulatory synergy so that the implementation of SPBE

is in line with the long-term development vision, including the smart city agenda and national digital transformation.

Theoretically, this study contributes to the local e-government literature by emphasizing the importance of regional contextual factors in measuring implementation maturity. In practical terms, these findings are useful for policymakers in formulating more adaptive and data-driven strategies to accelerate the digital transformation of government in Indonesia.

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