



E-Government in Indonesia: A Normative Study in Welcoming the Industrial Revolution 4.0

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Abstract

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The development of digital technology has encouraged governments in various countries, including Indonesia, to implement e-government as part of the transformation of public governance. This study aims to analyze the development of regulations, implementation barriers, and e-government projection strategies in the face of the Industrial Revolution 4.0. The method used is normative legal research by examining primary, secondary, and tertiary legal materials, as well as academic literature in the last five years. The results of the analysis show that although national regulations such as Presidential Regulation Number 95 of 2018 concerning SPBE have provided a legal framework, implementation at the regional level is still constrained by infrastructure, human resource limitations, and bureaucratic culture. Digital disparities also widen service disparities between regions. Therefore, it is necessary to strengthen adaptive regulations, increase the capacity of the apparatus, and harmonize central and regional policies. This article provides an academic contribution in the form of normative recommendations that can strengthen the legal basis of Indonesia's e-government towards inclusive and adaptive governance.



1. Introduction

The Industrial Revolution 4.0 era has brought significant changes to the pattern of interaction between the state and society. Digital technology is now the main instrument in the implementation of public services and governance. One of the important innovations born from this development is e-government, namely the use of Information and Communication Technology (ICT) to support government functions, improve administrative efficiency, expand public participation, and strengthen transparency. The concept of e-government is seen as strategic because it is able to respond to people's demands for fast, accountable, and open public services.¹

In Indonesia, the discourse on e-government gained great momentum after the 1998 reform. This period was marked by the birth of the people's demands for the principle of clean and good governance as a condition for the realization of democracy and social justice. To meet these demands, the government has begun to adopt a digital-based system as an instrument of bureaucratic reform. However, the adoption of e-government has not always been seamless. Wirawan² emphasized that although the implementation of e-government in quantity has increased, the quality is still inadequate because the implementation in many regions stops at the stage of providing static information, not comprehensive interactive services.

¹ Keld Pedersen. "E-government transformations: challenges and strategies." *Transforming Government: People, Process and Policy* 12, no. 1 (2018): 84-109.

² Vani Wirawan. "Penerapan E-Government dalam Menyongsong Era Revolusi Industri 4.0 Kontemporer di Indonesia." *Jurnal Penegakan Hukum Dan Keadilan* 1, no. 1 (2020): 1-16.

The importance of e-government became increasingly prominent when Presidential Regulation Number 95 of 2018 concerning Electronic-Based Government Systems (*Sistem Pemerintahan Berbasis Elektronik/SPBE*) was issued. This regulation emphasizes the government's commitment to realize more effective, transparent, and accountable governance through the integration of digital technology. However, the effectiveness of these regulations faces serious obstacles at the implementation level. Aminah and Saksono³ show that at the local government level, the implementation of e-government is often hampered by limited network infrastructure, lack of system interoperability, and resistance of bureaucratic apparatus to change.

In addition to technical problems, institutional factors are also the main challenges. Zeebaree et al.⁴ in their study using the Technology-Organization-Environment (TOE) framework found that non-technical obstacles such as low digital literacy of the apparatus, lack of organizational commitment, and bureaucratic culture that is not yet adaptive often determine the success of implementation more than just infrastructure factors. This obstacle shows that the development of e-government cannot only be seen as a technological issue, but also a transformation of organizational culture and law.

Globally, the transformation of e-government is seen not only as a strategy to improve public services, but also as an instrument of democratization. Malodia et

³ Sitti Aminah and Herie Saksono. "Digital transformation of the government: A case study in Indonesia." *Jurnal Komunikasi: Malaysian Journal of Communication* 37, no. 2 (2021): 272-288.

⁴ Mosleh Zeebaree, Mary Agoyi, and Musbah Aqel. "Sustainable adoption of E-government from the UTAUT perspective." *Sustainability* 14, no. 9 (2022): 5370.

al.⁵ emphasized that the future of e-government must be seen in the framework of integrating governance, technology, and citizen participation, where the success of implementation is determined by the state's ability to create adaptive regulations that are in harmony with disruptive technological developments. In the Indonesian context, this is even more relevant because digital disparities between regions have the potential to widen inequality in public services if not balanced with the right affirmative policies.

Based on the above framework, the formulation of this research problem is: first, how the development of regulation and implementation of e-government in Indonesia in the context of the Industrial Revolution 4.0; second, what are the main obstacles faced in its implementation; and third, how to formulate normative strategies to strengthen the sustainability of e-government in the future. The purpose of this study is to analyze existing regulations, identify implementation barriers, and provide projective recommendations based on normative legal approaches. Thus, this research not only provides an academic contribution to the e-government literature, but also offers a normative foundation for policymakers in formulating inclusive and adaptive digital governance in Indonesia.

2. Literature Review

The study of e-government has become one of the important topics in the discourse of public governance, especially in developing countries such as Indonesia.

⁵ Suresh Malodia, Amandeep Dhir, Mahima Mishra, and Zeeshan Ahmed Bhatti. "Future of e-Government: An integrated conceptual framework." *Technological Forecasting and Social Change* 173 (2021): 121102.

In general, the literature emphasizes that the success of e-government does not only depend on technological aspects, but also on regulatory frameworks, organizational readiness, and community participation. Roziqin et al.⁶ through bibliometric analysis found that the trend of e-government research in Indonesia has been increasing in the past decade, with the main focus on bureaucratic reform, information disclosure, and digital-based public services. This shows that e-government is seen as not just an administrative tool, but a strategic instrument in achieving good governance.

In the perspective of policy adoption, Samuel et al.⁷ highlight that developing countries face serious obstacles in the Technology-Organization-Environment (TOE) dimension. Technological barriers include infrastructure limitations and system interoperability, while organizational barriers include apparatus resistance, low digital literacy, and lack of managerial commitment. In the environmental dimension, the limitations of adaptive regulations and the lack of public participation are also challenges. Therefore, the success of e-government requires the integration of technology strategies with ongoing institutional reforms.

Conceptually, Rexhepi et al.⁸ suggests that the future of e-government must be seen in an integrative framework that emphasizes public participation as a key pillar. E-government is not only the digitization of services, but also a mechanism to strengthen the legitimacy of government through transparency, accountability, and

⁶ Ali Roziqin, Kismartini, Amaliana Nur Fajrina, Salahudin, and Tri Sulistyarningsih. "The development of Indonesian e-Government: A bibliometric analysis." *COLLNET Journal of Scientometrics and Information Management* 16, no. 1 (2022): 49-74.

⁷ Mercy Samuel, Gayatri Doctor, Perez Christian, and Manvita Baradi. "Drivers and barriers to e-government adoption in Indian cities." *Journal of Urban Management* 9, no. 4 (2020): 408-417.

⁸ Artan Rexhepi, Sonja Filiposka, and Vladimir Trajkovik. "Youth e-participation as a pillar of sustainable societies." *Journal of Cleaner Production* 174 (2018): 114-122.

citizen involvement in decision-making. This perspective is relevant for Indonesia, considering that digital disparities are still high and public trust in state institutions is often at stake. Thus, the existing literature provides a theoretical basis that the development of e-government must be understood as a multidimensional transformation involving legal, technological, organizational, and social participation aspects.

3. Method

This type of research is normative legal research with the main focus on literature review. Normative legal research emphasizes on the analysis of relevant legal texts, doctrines, and academic literature, so that the data used is entirely in the form of secondary data. The secondary data is divided into three categories, namely primary legal materials, secondary legal materials, and tertiary legal materials. Primary legal materials include legal instruments that directly regulate e-government and digital governance in Indonesia. Some of them are Law Number 25 of 2009 concerning Public Services, Presidential Regulation Number 95 of 2018 concerning Electronic-Based Government Systems (SPBE), as well as technical regulations from the Ministry of State Apparatus Empowerment and Bureaucratic Reform. This legal instrument is the main foothold in analyzing how the regulatory framework supports or hinders the implementation of e-government.

Secondary legal materials are in the form of academic literature consisting of journal articles, proceedings, and books that discuss concepts, theories, and empirical studies on the implementation of e-government. The literature analyzed

was limited to publications in the range of last five years to ensure contemporary relevance. Articles such as Roziqin et al.⁹, Aminah and Saksono et al.¹⁰, and Zeebaree et al.¹¹ are used to examine the barriers and development of e-government in Indonesia, while the study of Malodia et al.¹² provides a conceptual perspective on the future direction of e-government at the global level. This literature helps to provide a critical analysis of the extent to which regulation in Indonesia is in line with international practice and contemporary public administration theory. Meanwhile, tertiary legal materials are used to clarify the terminology and framework of the analysis. This material includes a legal encyclopedia, a dictionary of legal terms, a literature index, and a legal research methodology manual. The role of tertiary legal materials is to strengthen the consistency of the use of terms, such as the concepts of “digital governance,” “SPBE,” and “adaptive regulation.”

The data collection method is carried out through documentation studies by identifying, collecting, and reviewing relevant laws and regulations and academic literature. The analysis process is carried out by content analysis techniques, which are to describe the content of legal documents and academic literature to find patterns, gaps, and normative implications. This analysis is descriptive-analytical, meaning that it not only explains the content of the legal document, but also

⁹ Ali Roziqin, Kismartini, Amaliana Nur Fajrina, Salahudin, and Tri Sulistyarningsih. "The development of Indonesian e-Government: A bibliometric analysis." *COLLNET Journal of Scientometrics and Information Management* 16, no. 1 (2022): 49-74.

¹⁰ Sitti Aminah and Herie Saksono. "Digital transformation of the government: A case study in Indonesia." *Jurnal Komunikasi: Malaysian Journal of Communication* 37, no. 2 (2021): 272-288.

¹¹ Mosleh Zeebaree, Mary Agoyi, and Musbah Aql. "Sustainable adoption of E-government from the UTAUT perspective." *Sustainability* 14, no. 9 (2022): 5370.

¹² Suresh Malodia, Amandeep Dhir, Mahima Mishra, and Zeeshan Ahmed Bhatti. "Future of e-Government: An integrated conceptual framework." *Technological Forecasting and Social Change* 173 (2021): 121102.

criticizes its suitability with the challenges of implementing e-government in the era of the Industrial Revolution 4.0. With this approach, the research aims to produce a normative evaluation of the existing regulatory framework as well as formulate policy recommendations. The normative legal approach was chosen because it can provide a comprehensive and systematic legal map, which is indispensable to support the formulation of public policies in the field of e-government.

4. Results

4.1. Development of e-Government Regulations and Policies in Indonesia

The development of e-government in Indonesia shows that there has been significant progress in terms of regulation. Since Presidential Instruction No. 3 of 2003 concerning the National Strategy for the Development of e-Government was issued, the direction of the government's digitalization policy began to have a legal basis. However, an important milestone occurred with the birth of Presidential Regulation Number 95 of 2018 concerning the Electronic-Based Government System (SPBE) which explicitly regulates the principles of integration, interoperability, security, and accessibility in the implementation of digital-based government. This regulation is intended to create a transparent, efficient, and accountable bureaucracy.¹³

In addition to SPBE, various technical regulations are also issued to strengthen digital governance, including PAN & RB Ministerial Regulation Number

¹³ Kenneth J. Meier, Mallory Compton, John Polga-Hecimovich, Miyeon Song, and Cameron Wimpy. "Bureaucracy and the failure of politics: Challenges to democratic governance." *Administration & Society* 51, no. 10 (2019): 1576-1605.

1 of 2023 concerning Guidelines for the Implementation of the National Public Service Information System (*Sistem Informasi Pelayanan Publik Nasional/ SIPPN*). This policy requires ministries, institutions, and local governments to provide public information electronically and integrated. However, the implementation of this policy still faces challenges, especially in areas with limited infrastructure and low digital literacy of apparatus.¹⁴ Bibliometric analysis by Roziqin et al.¹⁵ shows that research interest in e-government in Indonesia has increased rapidly in the last decade, indicating that regulation has encouraged the development of academic discourse and bureaucratic practices. This research trend also highlights the close link between e-government regulation and the broader bureaucratic reform agenda. Regulations are considered not only legal instruments, but also tools for transforming bureaucratic culture towards technology-based public services.

However, the synchronization of regulations between the central and regional governments is still a serious problem. Many regions interpret e-government as limited to website development without integrating it with public service management systems. Flaumenhaft and Ben-Assuli¹⁶ emphasized that good regulation needs to be followed by a clear implementation mechanism, including interoperability standards between systems and strict accountability obligations. Without consistent synchronization and oversight mechanisms, regulation only

¹⁴ Vani Wirawan. "Penerapan E-Government dalam Menyongsong Era Revolusi Industri 4.0 Kontemporer di Indonesia." *Jurnal Penegakan Hukum Dan Keadilan* 1, no. 1 (2020): 1-16.

¹⁵ Ali Roziqin, Kismartini, Amaliana Nur Fajrina, Salahudin, and Tri Sulistyanyingsih. "The development of Indonesian e-Government: A bibliometric analysis." *COLLNET Journal of Scientometrics and Information Management* 16, no. 1 (2022): 49-74.

¹⁶ Yakov Flaumenhaft and Ofir Ben-Assuli. "Personal health records, global policy and regulation review." *Health policy* 122, no. 8 (2018): 815-826.

serves as a formal framework without having a substantive impact on improving the quality of public services. Thus, it can be concluded that the development of e-government regulations in Indonesia has a strong legal footing, but its effectiveness is still influenced by regional capacity disparities. Top-down regulations need to be complemented by a collaborative and adaptive approach so that they can be applied evenly across regions.

4.2. Technical, Organizational, and Institutional Barriers

The implementation of e-government in Indonesia faces various obstacles that can be categorized into technical, organizational, and institutional dimensions. From a technical perspective, the limitations of digital infrastructure are still the main obstacle, especially in remote areas. An uneven internet network causes digital-based public services to be not equally accessible to the entire community. Aminah and Saksono¹⁷ emphasized that digital infrastructure disparities widen the gap in services between regions, making it difficult to achieve the goal of equitable access to public information. Another technical obstacle is the limited interoperability between systems used by ministries, institutions, and local governments. Systems built sectorally are often not integrated, causing data redundancy and making it difficult to coordinate between agencies.

This is in line with the findings of Samuel et al.¹⁸ who highlight that without clear interoperability standards, e-government will only create new digital silos that

¹⁷ Sitti Aminah and Herie Saksono. "Digital transformation of the government: A case study in Indonesia." *Jurnal Komunikasi: Malaysian Journal of Communication* 37, no. 2 (2021): 272-288.

¹⁸ Mercy Samuel, Gayatri Doctor, Perez Christian, and Manvita Baradi. "Drivers and barriers to e-government adoption in Indian cities." *Journal of Urban Management* 9, no. 4 (2020): 408-417.

slow down services. In the organizational dimension, the resistance of bureaucratic culture is no less a challenge. Apparatus that is accustomed to manual systems often shows resistance to the adoption of digital technology. Chohan and Hu¹⁹ noted that the digital literacy of the apparatus is still low, while training and mentoring are not evenly distributed at all levels of government. This low human resource capacity has implications for the lack of innovation in utilizing the available e-government systems, so many applications are only used administratively without being optimized for the public interest.

From an institutional perspective, weak political commitment and regulatory inconsistencies are slowing down digital transformation. Malodia et al.²⁰ explained that the success of e-government is greatly influenced by the support of top management and regulations that are adaptive to technological developments. However, in Indonesia, there is still a frequent overlap of central and regional regulations, as well as a lack of effective supervision mechanisms. As a result, even though a legal framework is in place, implementation often stops at a symbolic level without providing any real change to the quality of public services. These technical, organizational, and institutional barriers are interrelated and reinforce each other. Limited infrastructure reduces the effectiveness of the system, bureaucratic cultural resistance slows adoption, while weak regulation and political commitment make e-government programs difficult to sustain. Therefore, the solutions offered must be

¹⁹ Sohail Raza Chohan and Guangwei Hu. "Strengthening digital inclusion through e-government: cohesive ICT training programs to intensify digital competency." *Information technology for development* 28, no. 1 (2022): 16-38.

²⁰ Suresh Malodia, Amandeep Dhir, Mahima Mishra, and Zeeshan Ahmed Bhatti. "Future of e-Government: An integrated conceptual framework." *Technological Forecasting and Social Change* 173 (2021): 121102.

multidimensional, involving the development of digital infrastructure, increasing the literacy of the apparatus, and the preparation of adaptive regulations that are consistent and harmonious between the central and regional governments.

4.3. Projections and Strategies for Strengthening e-Government in the 4.0 Era

Facing the dynamics of the Industrial Revolution 4.0, e-government in Indonesia must be projected not only as a means of digitizing services, but also as a strategic instrument to create inclusive, adaptive, and sustainable governance. The strategy to strengthen e-government needs to include the dimensions of regulation, technology, Human Resources (HR), and bureaucratic culture. In terms of regulation, regulations are needed that are more adaptive to the development of disruptive technologies such as artificial intelligence, blockchain, and big data. Chohan and Hu²¹ emphasized that regulations should not only be reactive, but must be proactive and visionary in order to be able to respond to future technological challenges. Presidential Regulation Number 95 of 2018 concerning SPBE is the first step, but further harmonization with regional regulations is absolutely necessary so that policy fragmentation does not occur.

In terms of technology, digital infrastructure investment needs to be expanded to remote areas. Meier et al.²² stated that the digital divide is a major threat

²¹ Sohail Raza Chohan and Guangwei Hu. "Strengthening digital inclusion through e-government: cohesive ICT training programs to intensify digital competency." *Information technology for development* 28, no. 1 (2022): 16-38.

²² Kenneth J. Meier, Mallory Compton, John Polga-Hecimovich, Miyeon Song, and Cameron Wimpy. "Bureaucracy and the failure of politics: Challenges to democratic governance." *Administration & Society* 51, no. 10 (2019): 1576-1605.

to the success of e-government because it has the potential to widen inequality in public services. Therefore, the government needs to encourage collaboration with the private sector in the provision of an integrated internet network and digital platform. The human resource dimension is also the key in the projection of strengthening e-government. Flaumenhaft and Ben-Assuli²³ emphasized the importance of intensive training programs for government officials, especially in digital literacy, cybersecurity, and data management. Competent apparatus are not only able to operate the system, but also play an active role in developing technology-based public service innovations.

In addition, the transformation of bureaucratic culture is both a challenge and an opportunity. Rexhepi et al.²⁴ highlights that the success of e-government is greatly influenced by the extent to which the bureaucracy is able to abandon the traditional mindset and switch to the digital governance paradigm. This can be achieved through visionary leadership, performance-based incentives, and reward and punishment mechanisms that encourage innovation. With a combination of adaptive regulations, equitable digital infrastructure, competent human resources, and innovative bureaucracy, e-government projection in Indonesia has great potential to become the main instrument in realizing transparent, accountable, and participatory governance. If this strategy is implemented consistently, e-government will not only

²³ Yakov Flaumenhaft and Ofir Ben-Assuli. "Personal health records, global policy and regulation review." *Health policy* 122, no. 8 (2018): 815-826.

²⁴ Artan Rexhepi, Sonja Filiposka, and Vladimir Trajkovik. "Youth e-participation as a pillar of sustainable societies." *Journal of Cleaner Production* 174 (2018): 114-122.

improve the quality of public services, but also strengthen the legitimacy of democracy in the era of the Industrial Revolution 4.0.

5. Discussion

The results of the study show that e-government in Indonesia already has a relatively adequate legal basis, especially with the birth of Presidential Regulation No. 95 of 2018 concerning SPBE. However, its implementation still faces major challenges at the regional level. This discussion highlighted three main aspects, namely regulatory and implementation gaps, structural barriers, and the need for adaptive strategies going forward. First, in terms of regulation, although a legal framework is available, often regulations are not fully responsive to the rapid development of technology. Regulations that are too rigid can slow down the adoption of innovation, while regulations that are too loose risk creating legal uncertainty. Roziqin et al.²⁵ emphasized that e-government regulation should be visionary and adaptive, not just reactive. Therefore, strengthening regulations needs to be carried out through periodic evaluations, harmonization between central and regional governments, and the preparation of clearer interoperability standards so that the system built does not run partially.

Second, structural barriers still have a great influence on the success of implementation. Uneven digital infrastructure, especially in areas outside Java, makes

²⁵ Ali Roziqin, Kismartini, Amaliana Nur Fajrina, Salahudin, and Tri Sulistyarningsih. "The development of Indonesian e-Government: A bibliometric analysis." *COLLNET Journal of Scientometrics and Information Management* 16, no. 1 (2022): 49-74.

it difficult to access e-government-based public services equally. Esmalian et al.²⁶ show that infrastructure disparity is one of the factors that widen the gap in public services. This obstacle is not only a technical issue, but also a social justice issue, because citizens living in areas with limited infrastructure have the potential to be overlooked in the process of digitizing public services. Third, institutional and bureaucratic cultural aspects also play an important role. Many apparatus are still stuttering with technology and reject changes because they are used to manual work patterns. Zeebaree et al. (2022) found that organizational resistance and low digital literacy of apparatus are more decisive factors than technical issues alone.

This indicates that bureaucratic reform through human resource capacity building and organizational culture transformation is the main requirement for the success of e-government. This discussion also needs to emphasize that the development of e-government is not only about digitizing services, but also creating public value. When citizens can access services quickly, cheaply, and transparently, public trust in the government will increase. On the other hand, if the system is only a formality without improving the quality of service, then the legitimacy of the government can be compromised. Therefore, the e-government strategy must put the interests of citizens as the main focus.

In addition, cross-sector collaboration also needs to be strengthened. The government cannot work alone in providing digital infrastructure and systems. Collaboration with the private sector, civil society, and academia will accelerate a

²⁶ Amir Esmalian, Shangjia Dong, Natalie Coleman, and Ali Mostafavi. "Determinants of risk disparity due to infrastructure service losses in disasters: a household service gap model." *Risk analysis* 41, no. 12 (2021): 2336-2355.

more inclusive digitalization process. This multi-stakeholder synergy can also ensure that digital innovation is not only limited to big cities, but also reaches remote areas. Thus, it can be concluded that the main challenges of e-government in Indonesia lie in the gap between regulation and implementation, structural barriers, and a bureaucratic culture that is not fully adaptive. However, with adaptive regulations, equitable infrastructure development, and increased human resource capacity, e-government projections in the era of the Industrial Revolution 4.0 can be realized more effectively.

6. Conclusion

This research shows that the implementation of e-government in Indonesia has a fairly strong regulatory foundation, especially with the existence of Presidential Regulation Number 95 of 2018 concerning SPBE and various other supporting regulations. However, the success of e-government is not only determined by regulations, but also by the readiness of infrastructure, apparatus capacity, and bureaucratic culture. The main challenges identified include digital infrastructure disparities between regions, low digital literacy of apparatus, organizational resistance to change, and lack of harmonization between central and regional policies.

In the future, strengthening e-government must be projected as a national strategic agenda in welcoming the Industrial Revolution 4.0. The strategies needed include the preparation of adaptive and visionary regulations, equitable distribution of digital infrastructure, capacity building of apparatus through continuous training,

and the transformation of bureaucratic culture towards a digital governance paradigm. In addition, multi-stakeholder collaboration between the government, the private sector, and civil society needs to be strengthened so that the digitization of public services can take place in an inclusive manner. With a multidimensional approach involving regulations, technology, human resources, and bureaucratic culture, e-government has the potential to be the main instrument in realizing governance that is transparent, accountable, participatory, and responsive to the needs of society in the digital era.

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