

E-Government Transformation in Indonesia: Opportunities, Challenges, and Public Service Optimization Strategies

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Abstract

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The transformation of e-government in Indonesia is a strategic effort by the government to utilize digital technology to improve efficiency, transparency, and quality of public services. Indonesia's achievement in the UN E-Government Survey, which placed it in the Very High E-Government Development Index category with a ranking of 64th in the world, shows significant progress. This research uses a qualitative method with a descriptive research type through a literature study of various relevant documents and data. The results of the study show that e-government provides real benefits, including cost and time efficiency, interagency service integration, and increased community participation. However, its implementation faces tangible, intangible, and very intangible obstacles, especially related to infrastructure, human resource capacity, political commitment, and digital literacy. To overcome these challenges, a comprehensive strategy is needed including equitable distribution of digital infrastructure, capacity building of apparatus, strengthening political commitment, and public education. The implementation of inclusive e-government will be the key to realizing good governance in Indonesia.

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1. Introduction

The transformation of e-government in Indonesia is a strategic step by the government in utilizing digital technology to improve efficiency, transparency, and quality of public services. These efforts include the provision of online services, the development of mobile applications, the use of open data, and the use of artificial intelligence technology in various aspects of the bureaucracy. The implementation of e-government is not only a response to technological developments, but also part of the bureaucratic reform agenda to realize more responsive, accountable, and community-satisfied governance.

Globally, the development of e-government is measured through the United Nations E-Government Survey. Indonesia managed to make significant progress by ranking 64th in the world, up 13 places from the previous year. Indonesia's E-Government Development Index (EGDI) score reached 0.7991, which placed the country in the Very High E-Government Development Index (VHEGDI) category. This achievement marks that Indonesia has been on a positive path in the development of a digital governance system. At the Southeast Asian level, Indonesia ranks fourth in the best e-government implementation, an achievement that reflects policy progress and technology deployment in the public sector.¹

International institutions such as the United Nations Department of Economic and Social Affairs (UNDESA) emphasize the importance of digitizing

¹ Indri Dwi Apriliyanti, Bevaola Kusumasari, Agus Pramusinto, and Widodo Agus Setianto. "Digital divide in ASEAN member states: analyzing the critical factors for successful e-government programs." *Online Information Review* 45, no. 2 (2021): 440-460.

public services as a means to improve the efficiency, transparency, and accessibility of services for all citizens. Digitalization is considered to be able to cut operational costs, reduce bureaucratic burdens, and expand public participation in the policy-making process. In the Indonesian context, the benefits of e-government include time and cost efficiency, increased transparency, prevention of corrupt practices, inter-agency integration, and strengthening public participation.² One of the concrete examples of its implementation is the SIGNAL (National Digital Samsat) application launched by the Indonesian National Police, allowing the public to take care of the renewal of the Vehicle Number Registration Letter (STNK) online.

However, the success of e-government in Indonesia cannot be separated from challenges. The obstacles faced can be categorized into three: tangible, intangible, and very intangible. Tangible barriers include limited physical infrastructure such as telecommunication networks and electricity supply, which are still obstacles especially in remote areas such as Papua and Maluku. Intangible barriers include the limitations of human resources who have digital competence, as well as economic constraints that affect the adoption of technology by the community. Meanwhile, very intangible obstacles are related to political commitment, bureaucratic discipline, and the formation of a knowledge society within the state apparatus.

Although the benefits of e-government have been proven, the gap in its implementation is still real. Not all regions have equal access to infrastructure and

² Ruci Meiyanti, Bagus Utomo, Dana Indra Sensuse, and Rinda Wahyuni. "e-Government challenges in developing Countries: A literature review." In *2018 6th International Conference on Cyber and IT Service Management (CITSM)*, pp. 1-6. IEEE, 2018.

digital literacy, resulting in service inequality. This challenge requires an integrated national strategy to address these barriers, especially in disadvantaged areas.³ The success of e-government transformation will depend heavily on the synergy between the central government, local governments, and the community, as well as the readiness of the resources owned.

Based on this background, this study aims to examine the process of implementing e-government-based public services in Indonesia, by highlighting the benefits, obstacles, and gaps that exist. This research will also use a case study of the SIGNAL application as a form of real implementation of e-government in the public service sector. With a qualitative approach and literature study methods, this study is expected to provide a comprehensive overview of the dynamics of e-government implementation in Indonesia, as well as offer recommendations for optimizing digital public services in the future.

2. Literature Review

The concept of public services in Indonesia is clearly regulated in Law Number 25 of 2009 concerning Public Services, which defines it as any form of activity in order to meet the needs of services for the community in accordance with the provisions of the law. In modern developments, public services do not only rely on face-to-face, but also integrate information technology as the main instrument. This is in line with the concept of e-government, which is the use of digital

³ Francesca Mongelli, Penelope Georgakopoulos, and Michele T. Pato. "Challenges and opportunities to meet the mental health needs of underserved and disenfranchised populations in the United States." *Focus* 18, no. 1 (2020): 16-24.

technology by the government to improve service quality, speed up processes, and expand service reach. Various literature shows that e-government can provide a number of strategic benefits. Jarke explained the three stages of digital transformation in public services: publish (one-way provision of information), interact (two-way interaction between service providers and recipients), and transact (the ability to conduct full transactions online).⁴

UNDESA emphasized that the implementation of e-government can overcome bureaucratic "pathologies" such as slow processes, high costs, and low transparency. The benefits of e-government include increased time and cost efficiency, cross-agency integration, prevention of corruption through transparency, and increased public participation. A Harvard Kennedy School of Government study identified three key elements for the successful implementation of e-government: support, capacity, and value. These elements become relevant benchmarks of success in the Indonesian context. Nonetheless, the literature also highlights a number of obstacles faced. Omodan groups challenges into three categories: tangible (physical infrastructure such as electricity and internet networks), intangible (human resource competence and economic readiness), and very intangible (political commitment, bureaucratic discipline, and digital culture).⁵ This obstacle is a determining factor why the implementation of e-government has not

⁴ Juliane Jarke. "Co-creating digital public services." *Co-creating digital public Services for an Ageing Society: Evidence for user-centric design* (2020): 15-52.

⁵ Boris Alexander Isaiah Becker, and Cornelia Eube. "Open innovation concept: Integrating universities and business in digital age." *Journal of Open Innovation: Technology, Market, and Complexity* 4, no. 1 (2018): 1-16.

been evenly distributed in Indonesia, especially in remote areas such as Papua and Maluku.

A relevant example of implementation is the SIGNAL application launched by the Indonesian National Police. This application allows people to extend their STNK online, but its use is still limited in areas with adequate digital infrastructure. This phenomenon shows that despite the availability of technology, the gap in access and digital literacy is still a major obstacle. The literature emphasizes that the success of e-government requires synergy between policies, infrastructure, human resource capacity, and community involvement. This study will examine the implementation of e-government in Indonesia with a focus on the benefits, barriers, and gaps that exist, as well as a case study of the SIGNAL application as an illustration of real implementation.

3. Method

This study uses a qualitative approach with a descriptive research type. This approach was chosen because it was able to provide an in-depth overview of the phenomenon of the implementation of e-government in public services in Indonesia, especially in the case study of the SIGNAL application. The purpose of this method is to comprehensively understand the context, processes, and challenges faced in the implementation of digital public services. The data collection technique is carried out through library research, which is the collection and analysis of documents relevant to the research topic. The documents used include laws and regulations, official government reports, results of international surveys such as the

UN E-Government Survey, journal articles, books, and credible news. This secondary data is obtained from various reliable sources, both national and international, to ensure the validity of the information used.

The data analysis process is carried out through the stages of data reduction, data presentation, and conclusion drawn. At the data reduction stage, the researcher sorts out relevant information from various sources, grouping according to themes such as the benefits of e-government, barriers, gaps, and SIGNAL case studies. The data presentation stage is carried out by compiling information in the form of a systematic narrative so that it is easier for readers to understand the relationship between the variables being studied. The last stage is the drawing of conclusions that formulate key research findings and their implications for the development of e-government in Indonesia.

A descriptive approach is used to provide a factual picture of the existing conditions, without manipulating variables. This study does not aim to test hypotheses, but rather to explain in depth the phenomena that occur, the factors that influence, and the potential for their development in the future. The selection of the SIGNAL application case study was carried out because this application is one of the e-government innovations that is quite popular in the public service sector and has a wide range of users in various regions of Indonesia. With this method, it is hoped that the research can provide a complete understanding of the dynamics of the implementation of e-government in Indonesia, including supporting factors, obstacles, and strategies needed for optimization. This qualitative-descriptive

approach is relevant considering that the issues studied are contextual, complex, and multidimensional.

4. Results

4.1. Implementation of E-Government in Indonesia

The implementation of e-government in Indonesia has experienced significant development in the past decade. Central and local governments are beginning to utilize digital technology to improve the quality of public services, expand access, and improve bureaucratic transparency.⁶ Based on the UN E-Government Survey, Indonesia managed to rank 64th in the world with an EGDI score of 0.7991, included in the Very High E-Government Development Index (VHEGDI) category. This achievement is a 13 rank jump compared to the previous year, which shows the government's strong commitment to advancing the digitalization of public services. The implementation of e-government in Indonesia includes several forms, including integrated service portals, mobile based applications, cross agency data integration, and the provision of open data for the public.⁷

The service model implemented follows technological developments, from simply providing information (publishing), then enabling two way interaction

⁶ Hafiez Sofyani, Hosam Alden Riyadh, and Heru Fahlevi. "Improving service quality, accountability and transparency of local government: The intervening role of information technology governance." *Cogent Business & Management* 7, no. 1 (2020): 1735690.

⁷ Amizan Omar, Vishanth Weerakkody, and Ahmad Daowd. "Studying Transformational Government: A review of the existing methodological approaches and future outlook." *Government Information Quarterly* 37, no. 2 (2020): 101458.

(interact), to supporting full online transactions (transact). Concrete examples can be found in online licensing services, digital tax systems, application-based health services, and cashless levy payments. One of the innovations that has received widespread attention is the SIGNAL (National Digital Samsat) application launched by the Indonesian National Police. SIGNAL facilitates the public to renew their *Surat Tanda Nomor Kendaraan* (STNK) online, integrate vehicle ownership data, and provide electronic payment methods. This application also minimizes face to face contact, thereby reducing the potential for illegal levies and speeding up the service process. However, the success of SIGNAL implementation is highly dependent on the quality of internet infrastructure and the level of digital literacy of users.

In addition to SIGNAL, various regions also develop their own e-government platforms, such as the Jogja Smart Service application in Yogyakarta, Lapor! as a national complaint channel, and an OSS (Online Single Submission) licensing system for the business world. This diversity of innovations shows the existence of regional creativity in adapting e-government to the specific needs of the community. Although these achievements are appreciated, the implementation of e-government still faces challenges. Technology infrastructure is not evenly distributed, especially in remote areas such as Papua, Maluku, and border areas. In addition, the readiness of human resources, both in terms of apparatus and the community, has not been optimal. This gap results in the benefits of e-government not being felt equally by all citizens.

In the future, the implementation of e-government requires a more integrated strategy. The government needs to ensure the availability of infrastructure, provide

extensive digital literacy training, and build public awareness of the benefits of digital public services. Cross-agency integration also needs to be strengthened so that the public can access various services through a one stop service. With this approach, e-government in Indonesia can be an effective instrument to realize efficient, transparent, and inclusive governance.

4.2. Benefits of E-Government in Public Services

The implementation of e-government in Indonesia has had a significant positive impact on the quality of public services. One of the main benefits is time and cost efficiency. With the digitization of administrative processes, people no longer have to spend hours taking care of documents at service offices.⁸ The process that previously required physical and face to face files can now be done online through an official application or portal. For example, the renewal of the STNK through the SIGNAL application allows users to save on transportation costs and avoid long queues. This efficiency is also felt by government agencies because the administrative workload is reduced and the service flow becomes more structured.

The second benefit is increased transparency and corruption prevention. Digitalization allows the entire service process to be recorded electronically, thereby minimizing the chance of illegal levies. The publication of budget data, activity reports, and the procurement process of goods/services through the official government portal provides an opportunity for the public to monitor the

⁸ Ida Bring Løberg. "Efficiency through digitalization? How electronic communication between frontline workers and clients can spur a demand for services." *Government information quarterly* 38, no. 2 (2021): 101551.

performance of the bureaucracy.⁹ This transparency is an important instrument to build public trust in the government. The third benefit is increased community participation. E-government opens up a wider space for communication between the government and citizens. Through platforms such as Lapor!, the public can submit complaints, suggestions, and inputs directly. This encourages the creation of participatory governance, where citizens' voices are considered in public decision-making. The fourth benefit is the integration of services between agencies.

In the traditional government model, people often have to move between agencies to take care of various permits or documents. Through e-government, services from various agencies can be integrated in one platform, for example the OSS (Online Single Submission) system for business licenses.¹⁰ This integration makes it easier for the community while accelerating the service process. A concrete example of the benefits of this integration can be seen in the SIGNAL app. This application connects motor vehicle data, regional taxation systems, and electronic payment systems. Thus, users only need to access one application to complete the entire STNK renewal process, from data verification to payment and document delivery.

The fifth benefit is the improvement of the quality of data-driven public services. With a digital system, the government can collect big data that can be used to analyze people's needs. This analysis allows the government to design policies and

⁹ Farhina Ahmed, Sharif As-Saber, Simon Fry, and R. Smith. "Bureaucracy and E-government: A study of e-procurement initiatives in Bangladesh." *Journal of Business Management & Compliance* 1, no. 1 (2019): 35-51.

¹⁰ Astri Siti Fatimah. "Online Single Submission (OSS) Based on E-Government Implementation in Micro Small Medium Business Licensing (MSMEs)." *Journal of Governance* 7, no. 4 (2022): 912-922.

programs that are more targeted, according to the characteristics and needs of certain regions. Although the benefits are real, the distribution of benefits from e-government is not evenly distributed. Areas with low infrastructure and digital literacy have not been able to fully feel these benefits. Therefore, efforts to equalize access and increase the capacity of human resources are important requirements so that the benefits of e-government can be enjoyed by all Indonesian people.

4.3. Implementation Challenges and Gaps

The implementation of e-government in Indonesia still faces various complex obstacles. These obstacles can be categorized into three types, namely tangible, intangible, and very intangible. Tangible barriers include limitations in physical infrastructure such as internet networks, electricity, and hardware.¹¹ Remote areas such as Papua, Maluku, and some areas in Nusa Tenggara still have low connectivity levels, thus hindering access to digital services. This condition has implications for the low penetration of e-government applications such as SIGNAL in these areas. Intangible barriers include the limitation of human resources (HR) who have competence in the field of information technology. Government apparatus in some regions do not have adequate technical skills to operate the e-government system optimally. In addition, economic factors also affect people's ability to access digital services. For example, some residents in disadvantaged areas do not have smartphone devices or stable internet access to use online services.

¹¹ Nur Farah Hanna Mohd Rohaizad, Ezdihar Hamzah, and Hariati Abdullah. "Tangible and intangible factors incorporated for infrastructure asset valuation." *Planning Malaysia: Journal of the Malaysian Institute of Planners* 3, no. 19 (2021): 1.

Very intangible barriers are more non-technical, but have a major impact on the success of implementation.¹² This factor includes political commitment, bureaucratic discipline, and the formation of a digital culture (knowledge society) among state apparatus. The lack of courage for regional leaders to enforce the rules and lead digital transformation is often a major obstacle. Without a strong commitment, e-government innovation has the potential to only become a short-term project without sustainability. The implementation gap is also seen from the difference in service quality between urban and rural areas. In big cities such as Jakarta, Surabaya, and Bandung, access to digital services is relatively easy and supported by adequate infrastructure. In contrast, in remote areas, internet access is still limited and connection costs are relatively expensive, so the adoption of e-government is slow.¹³ This creates inequality that has the potential to widen social and economic gaps between regions.

In addition, the socialization of the use of e-government services is still uneven. Many people do not know the existence of certain applications or platforms, or do not understand how to use them. The lack of public education campaigns results in low participation in utilizing digital services. Overcoming these challenges requires a comprehensive strategy that includes infrastructure development, human resource capacity building, strengthening political commitment, and public

¹² J. Ignacio Criado and J. Ramon Gil-Garcia. "Creating public value through smart technologies and strategies: From digital services to artificial intelligence and beyond." *International Journal of Public Sector Management* 32, no. 5 (2019): 438-450.

¹³ Raj Kumar Goel, and Shweta Vishnoi. "Urbanization and sustainable development for inclusiveness using ICTs." *Telecommunications Policy* 46, no. 6 (2022): 102311.

education. Without these measures, the benefits of e-government will be difficult to feel evenly, and the digital public service gap will continue.

5. Discussion

The implementation of e-government in Indonesia shows encouraging developments, but it also presents challenges that require special handling strategies. Based on the results of the study, it can be seen that the benefits generated by e-government such as time and cost efficiency, increased transparency, corruption prevention, and expanded public participation, have actually encouraged the improvement of the quality of public services. Innovations such as the SIGNAL application are concrete examples of how digital technology can simplify administrative processes, reduce the potential for illegal practices, and provide convenience for service users.¹⁴ However, this achievement has not been evenly distributed. The inequality of digital infrastructure between urban and rural areas, especially in remote areas such as Papua and Maluku, hinders the expansion of the benefits of e-government. Tangible barriers such as limited internet and electricity networks are the main obstacles that require long-term policy interventions. Without adequate basic infrastructure, the implementation of e-government cannot be optimal, and even tends to create new gaps in public services.

In addition, intangible obstacles related to human resource capacity and community economic conditions are also limiting factors. Government officials who

¹⁴ Maxat Kassen. "Blockchain and e-government innovation: Automation of public information processes." *Information systems* 103 (2022): 101862.

lack mastery of digital technology often face difficulties in operating new systems. Meanwhile, people with economic limitations may not have adequate devices or internet access to use online services. This indicates the need for training and empowerment programs for both the apparatus and the community, so that technology adoption can run effectively. Very intangible factors such as political commitment and the formation of a digital culture also play an important role. Digital transformation requires full support from regional leaders and the central government, including the courage to enforce bureaucratic discipline and build a knowledge society. Without a clear commitment and vision, e-government initiatives risk stalling or running half-heartedly.

The implementation gaps found in this study also show that socialization and public education are still less than optimal. Many people do not know or understand the use of digital public service applications, so the participation rate is still low. This emphasizes that digital transformation does not only depend on the availability of technology, but also on people's digital literacy. Strategies that can be implemented to overcome these challenges include four main steps. First, the development and equitable distribution of digital infrastructure to remote areas. Second, increasing the capacity of human resources of the apparatus through intensive and continuous training. Third, strengthening political commitment through consistent national policies in supporting digital transformation. Fourth, increasing people's digital literacy through massive and targeted educational campaigns. If these measures can be carried out synergistically, e-government has the potential to become a strategic instrument to realize effective, efficient, transparent, and participatory governance.

Furthermore, the successful implementation of e-government will strengthen public trust in the government and support the realization of good governance in Indonesia.

6. Conclusion

The transformation of e-government in Indonesia has made a real contribution to improving the quality of public services. Indonesia's achievements in the UN E-Government Survey, which are included in the Very High E-Government Development Index category, show significant progress in the use of digital technology by the government. The benefits obtained include time and cost efficiency, increased transparency, corruption prevention, inter-agency service integration, and increased community participation. The case study of the SIGNAL application is proof that digitalization can simplify service procedures and provide convenience for users. However, the challenges faced are still quite large. Tangible obstacles in the form of infrastructure limitations, intangible obstacles related to human resource capacity and economic conditions, as well as very intangible obstacles such as political commitment and digital culture, are inhibiting factors that require serious attention.

The gap in access between urban and rural areas shows that equitable distribution of infrastructure and digital literacy is still a big homework for the government. To optimize the implementation of e-government, a comprehensive strategy is needed. The government needs to prioritize the equitable distribution of digital infrastructure, increase the capacity of apparatus and the community,

strengthen political commitment, and intensify public education. The implementation of inclusive and sustainable e-government will be the key to realizing responsive, transparent, and quality public services, while supporting the realization of good governance in Indonesia.

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