INTERNATIONAL JOURNAL OF GOVERNMENT SCIENCE AND PUBLIC ADMINISTRATION

NAWALA

Volume 4, Number 2, 2025

Smart Village Policy in Mojokerto Regency: An Analysis of Village Government Readiness in the Digital Era

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Abstract

Article history:
Received: March 1, 2025
Revised: April 20, 2025
Accepted: Mey 15, 2025
Published: June 30, 2025

Keywords:
Digital Readiness,
Mojokerto,
Policy Implementation,
Smart Village,
Village Government.

Identifier:
Nawala
Page: 66-81
https://nawala.io/index.php/ijgspa

This research analyzes the implementation of the Smart Village policy in Mojokerto Regency and assesses the readiness of village governments in facing the digital era. The Smart Village concept promotes technology-based governance aligned with smart governance principles to improve service efficiency and community participation. Using a descriptive qualitative approach, the study focuses on three villages: Kaligoro, Trowulan, and Randugenengan. Data were obtained through interviews, observation, and documentation, analyzed using Miles and Huberman's interactive model. The findings reveal that Smart Village implementation has begun through digitalization programs but remains suboptimal due to limited digital literacy, unequal ICT infrastructure, and weak institutional coordination. Supporting factors include regional policy backing, community engagement, and district government commitment. The study highlights the need to strengthen digital readiness by enhancing human resource capacity, developing ICT infrastructure, and improving institutional collaboration. In conclusion, the success of Smart Village initiatives depends on a collaborative strategy between local governments, village administrations, and communities to achieve smart, efficient, and sustainable rural governance.

1. Introduction

The development of Information and Communication Technology (ICT) has shifted the paradigm of government administration from a traditional bureaucratic model to a more open, participatory, and data-driven system. Government digitalization encourages the creation of smart governance that emphasizes transparency, efficiency, and collaboration between the government, the public, and the private sector.[1] In the Indonesian context, the direction of digital government transformation is reinforced through Presidential Regulation Number 95 of 2018 concerning Electronic-Based Government Systems (*Sistem Pemerintahan Berbasis Elektronik*/SPBE), which emphasizes the importance of technology integration at all levels of government, including at the village level.

One form of implementation of the SPBE policy at the grassroots level is the development of Smart Villages. This concept adopts Smart City principles but is adapted to the social, economic, and cultural characteristics of rural communities. According to the Ministry of Communication and Information Technology (2022), a Smart Village is a model of village governance that utilizes digital technology to increase the efficiency of public services, empower communities, and promote sustainable development. Meanwhile, according to the Komorowski and Stanny,[2] a Smart Village is a rural community that relies on innovative digital technology-based solutions to strengthen the local economy, improve public services, and enhance the quality of life of its residents.

[1] Marco Di Giulio and Giancarlo Vecchi. "Implementing digitalization in the public sector. Technologies, agency, and governance." *Public Policy and Administration* 38, no. 2 (2023): 133-158.
[2] Łukasz Komorowski and Monika Stanny. "Smart villages: Where can they happen?." *Land* 9, no. 5 (2020): 151.

Mojokerto Regency is one of the regions in East Java that has taken steps towards becoming a Smart Village through the Village Digitalization program since 2021. This program is implemented by the Communication and Informatics Office (*Dinas Komunikasi dan Informatika*/Diskominfo) in collaboration with the Community and Village Empowerment Office (*Dinas Pemberdayaan Masyarakat dan Desa*/DPMD). The program's main focus is to increase the capacity of village officials in utilizing information technology, develop the Village Information System (*Sistem Informasi Desa*/SID) as a development database, and create digital public services that are easily accessible to the public. For example, Kaligoro Village in Kutorejo District has launched the Smart Kaligoro application for administrative services and promoting local potential, while Trowulan Village has begun integrating tourism, MSME, and cultural data into a web-based system.

However, initial observations and interviews indicate that the implementation of the Smart Village policy in Mojokerto is not yet fully optimal. Limited digital literacy among officials and the community is a major obstacle. Aziiza and Susanto[3] emphasized that "human resource capacity is a key factor in the success of Smart Village implementation, because technology can only function effectively if supported by user competence." Furthermore, Dirgatama et al.[4] found that low digital literacy and minimal ICT infrastructure are the main inhibiting factors in the implementation of digital villages in Central Java. A similar situation also occurs in

[3] Aziiza, A. A., and T. D. Susanto. "The smart village model for rural area (case study: Banyuwangi Regency)." In *IOP Conference Series: Materials Science and Engineering*, vol. 722, no. 1, p. 012011. IOP Publishing, 2020.

[4] Chairul Huda Atma Dirgatama, Sigit Permansah, and Dede Rusmana. "Understanding smart village concepts: digital literacy and mobile technology." *Journal of Education and Learning (EduLearn)* 18, no. 3 (2024): 1015-1028.

Mojokerto, where some villages still have limited internet access and inadequate technological devices.

In addition to human resources and infrastructure, inter-agency coordination issues also pose a serious obstacle. Sella et al.[5] highlights the importance of institutional integration and communication between actors in ensuring the sustainability of the Smart Village program. This aligns with the view of Muthanna and Sang,[6] who explain that the effectiveness of policy implementation is greatly influenced by policy standards and objectives, resources, and inter-organizational communication. Therefore, the success of a Smart Village depends not only on the availability of technology but also on the synergy between stakeholders in its implementation.

This situation indicates a gap between policy design and implementation. Village governments, as the primary implementers, often lack digital readiness, encompassing human resources, technology, and institutional aspects.[7] This readiness is a crucial prerequisite for building a sustainable, digital-based village government system.

Therefore, this community service activity was carried out to address the real needs of village partners in Mojokerto Regency, particularly in strengthening the digital readiness of village government. This activity involved village officials, SID

[5] Domi Sella and Sari Viciawati Machdum. "Implementation of the Smart Village Policy to Enhance Public Services in Srimulyo Village, Piyungan Sub-district, Bantul Regency, Yogyakarta Special Region." *Asian Journal of Management, Entrepreneurship and Social Science* 4, no. 03 (2024): 891-912.

[6] Abdulghani Muthanna and Guoyuan Sang. "A conceptual model of the factors affecting education policy implementation." *Education Sciences* 13, no. 3 (2023): 260.

[7] OECD. *Digital government index: 2019 results.* Paris: OECD Publishing. 2020.

operators, and community users of digital services as key partners. Through training, mentoring, and the implementation of an integrated village information system, this activity is expected to improve the ability of officials to utilize digital technology, strengthen institutional governance, and expand community participation in village development. A collaborative approach between local government, academics, and the community is a key strategy for realizing village governance that is intelligent, inclusive, and adaptive to technological developments.[8]

2. Literature Review

2.1 Smart Village Concept and Policy Framework in Indonesia

The Smart Village concept emerged as a rural adaptation of the Smart City model, focusing on the integration of information and communication technology (ICT) to improve the quality of governance, public services, economic development, and community participation. A Smart Village is characterized by the ability to embed digital tools in administrative services, enhance communication systems, and promote transparency through process digitalization and documentation. Moreover, it fosters technology-based community empowerment through internet access, e-commerce, and agricultural applications, supporting inclusive rural growth. The Smart Village framework generally encompasses six key dimensions: smart governance, smart infrastructure, smart people, smart economy, smart environment, and smart living.

[8] Nailing Tian and Wei Wang. "Innovative Pathways for Collaborative Governance in Technology-Driven Smart Communities." *Sustainability* 17, no. 1 (2024): 98.

In Indonesia, the digital transformation of villages is guided by several major policies. The Village Law No. 6 of 2014 underlines village autonomy and innovation through the use of technology. Additionally, the Digital Village/Smart Village programs launched across provinces such as West Java, Central Java, Lampung, and Southeast Sulawesi promote local digital integration. The Village Funds policy further supports the procurement of digital devices and training initiatives, while the Village Information System (SID) developed by regional governments and NGOs enables digital-based service management. Collectively, these frameworks emphasize that supportive regulations and institutional structures such as roadmaps, SOPs, and mentoring mechanisms are essential to achieving comprehensive Smart Village implementation. Without these, digitalization efforts often remain fragmented and unsustainable, limiting rural innovation and connectivity across administrative levels.

2.2 Digital Readiness, Empirical Findings, and Implementation Challenges

The readiness of village governments to adopt digital transformation can be analyzed through governance, infrastructure, and human resource dimensions. Governance readiness relates to how digitalization enhances efficiency, data transparency, and citizen participation through online services. However, challenges persist due to limited coordination between administrative levels, absence of digital SOPs, and insufficient commitment from local leaders. ICT infrastructure readiness remains another critical factor; the success of Smart Villages depends on reliable internet connectivity, adequate computer and server facilities, and accessible service applications. Villages in 3T regions (underdeveloped, frontier, and outermost) still face significant technological barriers, unlike peri-urban villages that adapt more

rapidly. Human resource readiness also plays a key role, as low digital literacy and lack of continuous training often hinder adoption, though studies show that targeted training programs significantly improve performance.

Empirical findings in Indonesia indicate that digitized villages experience improved efficiency in administrative and financial transparency, yet those with low readiness struggle with fragmented systems and poor inter-agency integration. Collaboration between local governments, universities, and digital communities has proven to be a vital driver of successful Smart Village adoption. Nevertheless, persistent challenges include unequal access to digital infrastructure, reliance on third parties for app management, weak regulatory standards for data security, and low community participation due to limited digital access. The digital readiness model covering organizational, technological, human capability, and environmental readiness serves as a theoretical framework to assess and strengthen sustainable Smart Village development in Indonesia.

3. Methods

This research applies a case study method focused on implementing digital transformation in village governance in Mojokerto Regency. The activity began with initial observations and problem identification through direct visits to village public service offices, assessments of the Village Information System (SID), and evaluations of existing technological facilities. These observations aimed to analyze the digital readiness of village officials in operating technology and managing online public services. Findings from this stage were used to identify key problems that

formed the foundation of the community service activities, further supported by interviews with the Village Head, SID operators, and other officials, as well as reviews of SPBE reports and ICT infrastructure data. The method was designed to address the low level of digital readiness among village governments, particularly concerning digital literacy, technology infrastructure, and institutional coordination. The approach follows a participatory and collaborative model, involving community members and village officials as active partners aligning with Suaib,[9] who emphasizes participatory rural development where communities serve as primary actors in technology-based development.

The implementation consisted of five stages: (1) identifying needs, (2) designing digital solutions, (3) training and mentoring, (4) system implementation, and (5) evaluation. In the solution design phase, a Smart Village model was developed based on local conditions, including training materials tailored to participants' literacy levels. The training stage involved workshops, simulations, and practical exercises to enhance officials' competence in digital systems, data management, and online services echoing Aziiza and Susanto[10] findings on Smart Village implementation in Banyuwangi. During implementation, digital village systems were integrated and supported by the Communication and Information Agency and DPMD Mojokerto. The final stage, evaluation, used qualitative interviews and quantitative Likert-scale assessments to measure improvements in digital literacy, technical skills, and system utilization. Data were analyzed

[9] Suaib, M. Si. *Pembangunan dan pemberdayaan masyarakat*. Indramayu: Penerbit Adab, 2023.

[10] Aziiza, A. A., and T. D. Susanto. "The smart village model for rural area (case study: Banyuwangi Regency)." In *IOP Conference Series: Materials Science and Engineering*, vol. 722, no. 1, p. 012011. IOP Publishing, 2020.

descriptively using Microsoft Excel and SPSS, showing measurable gains in digital competence and service effectiveness.

4. Results and Discussion

This community service activity was carried out in three partner villages: Kaligoro Village (Kutorejo District), Trowulan Village (Trowulan District), and Randugenengan Village (Dlanggu District). Each village was selected based on its varying levels of Smart Village implementation to obtain a comprehensive picture of the digital readiness of village governments in Mojokerto Regency. The activity lasted for three months and involved a total of 45 participants, consisting of Village Heads, Village Secretaries, Village Information System (SID) operators, and representatives of community users of digital public services.

Initial observations indicate that all three villages have government digitalization initiatives, but their implementation is not yet uniform. Kaligoro Village has the highest level of readiness, having already used the Smart Kaligoro application for administrative services and promoting village potential. Trowulan Village has a web-based system that integrates tourism and MSME data, but it is still limited to internal administrators. Meanwhile, Randugenengan Village has only recently begun using the SID and still relies on manual tools.

Table 1. Initial Conditions of Digital Readiness of Partner Village Governments

Digital Readiness Aspects	Kaligoro	Trowulan	Randugenengan
Digital literacy of civil servants	Tall	Currently	Low
Internet infrastructure	Quite stable	Unstable	Limited
Use of SID	Active	Limited	Just started
Institutional commitment	Good	Currently	Weak

Table 1 shows that human resources and infrastructure are the main challenges affecting the success of Smart Village implementation. This aligns with Aziiza and Susanto[11] findings, which emphasized that the success of Smart Villages is largely determined by the digital literacy of village officials. The next stage of the activity focused on direct training and mentoring, which involved the active participation of all village officials and related stakeholders. This stage was designed to provide hands-on experience in digital transformation and ensure that participants could independently operate and manage village information systems. The training was divided into three structured sessions. The first session, titled Digital Literacy and Transformation, introduced participants to the fundamental concepts of Smart

[11] Aziiza, A. A., and T. D. Susanto. "The smart village model for rural area (case study: Banyuwangi Regency)." In *IOP Conference Series: Materials Science and Engineering*, vol. 722, no. 1, p. 012011. IOP Publishing, 2020.

Village, SPBE (Electronic-Based Government Systems), and smart governance. This session aimed to strengthen participants' conceptual understanding of how digital transformation supports efficient and transparent governance at the village level.

The second session consisted of Village Information System (SID) Technical Training. In this stage, participants were guided through practical exercises on how to input population data, manage digital documents, and administer online-based public services. The training emphasized accuracy and consistency in data management, as the SID serves as the main platform for digital village administration. The third session, Digital Content Management and Online Public Services, focused on building participants' skills in creating digital content for promoting local village potential and managing public feedback through online complaint systems.

Beyond improving digital literacy and competence, the program achieved three significant outcomes. First, each participating village successfully formed a Village Digital Management Team responsible for monitoring SID operations and managing public service portals. Second, previously inactive village website domains, particularly in Trowulan and Randugenengan, were reactivated to enhance public information access. Finally, a Village Digital Operational Guide (*Profil Organisasi dan Data Desa*/PODD) was developed as a standardized reference for maintaining and optimizing digital systems at the village level.

5. Discussion

The results of this community service activity demonstrate that a participatory approach is highly effective in enhancing the digital readiness of village governments. By directly involving village officials in training and mentoring activities, the program significantly improved their ability to operate and manage digital systems. This enhancement has had a measurable impact on the efficiency of public service delivery and the transparency of village governance. The findings align with the theory of policy implementation by Muthanna and Sang,[12] which asserts that successful implementation depends on three main factors: available resources, effective communication, and the commitment of implementers. Within the context of the Smart Village program in Mojokerto Regency, these factors were strengthened following the community service initiatives. Human resource capacity improved through digital literacy training, inter-agency communication was established through coordination with the Communication and Information Agency, and institutional commitment was reinforced by forming a Village Digital Management Team tasked with maintaining and developing the digital systems.

These outcomes are consistent with Sella et al.[13] research in Bantul, which found that consistent collaboration and long-term mentoring play a crucial role in the successful implementation of Smart Villages. As a result of this program, partner villages in Mojokerto began transitioning from manual administrative practices

[12] Abdulghani Muthanna and Guoyuan Sang. "A conceptual model of the factors affecting education policy implementation." *Education Sciences* 13, no. 3 (2023): 260.

[13] Domi Sella and Sari Viciawati Machdum. "Implementation of the Smart Village Policy to Enhance Public Services in Srimulyo Village, Piyungan Sub-district, Bantul Regency, Yogyakarta Special Region." *Asian Journal of Management, Entrepreneurship and Social Science* 4, no. 03 (2024): 891-912.

toward technology-based governance, emphasizing the importance of continuous system maintenance and adaptation. However, several challenges remain, notably related to unstable network infrastructure and limited operational budgets for system maintenance. These constraints highlight that the sustainability of Smart Village initiatives depends not only on technical competence but also on long-term policy support and multi-level collaboration among government stakeholders.

The implications of these activities are threefold. Practically, village officials now possess the essential skills to operate digital systems, thereby improving service quality and responsiveness. Institutionally, the establishment of a dedicated digital management team serves as a structural foundation for ongoing Smart Village development. From a policy perspective, the program provides valuable input for the Mojokerto Regency Government in formulating strategies to strengthen digital capacity systematically and sustainably across all villages.

Table.2 Series of Smart Village Community Service Activities in Mojokerto Regency

No	Activity Stages	Activity Description	Execution time	Output / Results
1	Observation and Problem Identification	Field surveys and initial interviews with Village Heads, SID operators, and village officials to determine the initial conditions of digital literacy and public service systems.	Day 1–2	Initial data on village digital readiness and training needs.
2	Design and Preparation of Training Materials	Develop training modules and technical guides for using the Village Information System (SID)	Day 3	The training modules and implementation

		and online public service applications.		plan are ready to use.
3	Digital Literacy Training for Village Officials	Introduction to the Smart Village concept, the use of digital devices, and online-based public service governance.	Day 4–5	The apparatus understands the basics of digital literacy and the benefits of Smart Village.
4	SID Technical Training and Mentoring	Direct practice of data input, document management, and operation of village digital systems with guidance from the community service team.	Days 6–8	Village operators are able to operate SID independently.
5	Implementation of Digital Systems and Institutional Strengthening	Activation of the online public service system, formation of a village digital management team, and system trials at the village office.	Days 9–11	The village digital system is active and a management team is formed.
6	Evaluation and Monitoring of Activity Results	Implementation of post-test, feedback interviews, and analysis of training effectiveness using a simple Likert scale.	Days 12–14	Report on activity results and recommendations for program sustainability.

6. Conclusion

the Smart Village policy in Mojokerto Regency has shown significant progress in driving digital transformation at the village government level, although it is not yet fully optimal. The digital readiness of village officials has improved through training and mentoring activities, as evidenced by the increase in digital literacy scores and the improvement of technical skills in operating the Village Information System (SID). The formation of a village digital management team and the development of the Village Digital Operational Guidelines (PODD) are concrete

steps in strengthening digital institutions at the local level. The main success factor lies in collaboration between local governments, village officials, and the community, which aligns with the principles of smart governance based on participation and transparency. However, challenges remain, particularly in terms of uneven ICT infrastructure, budget constraints, and the need for ongoing mentoring. Overall, these activities demonstrate that a participatory and collaborative approach can be an effective model for strengthening digital readiness and building smart, efficient, and sustainable village governance.

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