

Implementation of Smart Villages Based on Local Community Participation within a Digital Governance Framework in Indonesia and Malaysia

Kiki Endah¹, Ahmad Juliarso², Irfan Nursetiawan³, Ally Mom⁴

^{1,2,3}Universitas Galuh, Ciamis, Indonesia

⁴Government of Port Moresby, Papua New Guinea

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ABSTRACT

The implementation of smart villages within the digital governance framework in Indonesia and Malaysia still faces challenges in optimizing local community participation as the main actors in digital village development. This study aims to analyze the role of local community participation in improving the effectiveness of smart village implementation within the context of digital governance in both countries. The method used is a qualitative approach with a comparative study design through interviews, observations, and documentation studies. The results show that local community participation significantly influences program sustainability, technology adoption, and policy legitimacy. The novelty of this study lies in the discovery of a participatory digital governance model based on cultural embeddedness that integrates local cultural values into the village digital system as a key factor in successful implementation. In addition, there are differences in participation patterns between Indonesia and Malaysia, influenced by institutional and social contexts. In conclusion, the success of smart villages is not only determined by technology, but by adaptive, participatory, and contextual digital governance.

Keywords: smart village; digital governance; local communities; digital governance.

INTRODUCTION

Digital transformation has become a strategic agenda in rural development as part of the digital governance paradigm, emphasizing the integration of information technology in public service delivery, strengthening local economies, and inclusively improving community welfare [4], [5]. In the Southeast Asian context, particularly in Indonesia and Malaysia, the smart village initiative has begun to be adopted as a policy instrument to encourage villages to become adaptive, innovative, and data-driven entities. However, the implementation of this technology-based village development has not been fully optimized [1], [2].

Various studies indicate structural challenges that include the digital divide, limited human resource capacity in digital literacy and skills, and the immaturity of village institutions in managing sustainable digital transformation [3]. Furthermore, a top-down approach often ignores the socio-cultural dimension and local community participation, resulting in low levels of technology adoption and program sustainability. Therefore, a more contextual approach is needed through the integration of local community participation within a digital governance framework to ensure that smart village development is not only technology-based but also rooted in the needs, values, and social dynamics of the local community [6], [7], [8].

Data on the increase in internet users in Indonesia is an urgent matter in implementing Smart Villages. The data on internet users is as follows:

Table 1. Internet User Data in Indonesia 2012-2022

No.	Year	Rural Area (%)	Urban Area (%)	Rural and Urban Area (%)
1.	2012	16,12	30,66	45,43
2.	2013	17,86	31,75	45,80
3.	2014	20,84	35,63	50,53
4.	2015	26,84	41,98	57,03
5.	2016	31,79	47,22	61,88
6.	2017	41,99	57,33	70,89
7.	2018	51,90	66,22	78,08
8.	2019	61,24	75,73	83,00
9.	2020	67,19	78,18	86,81
10.	2021	73,57	82,07	88,53
11.	2022	80,54	86,54	90,90

Source: Badan Pusat Statistik (BPS), 2023.

The gap in internet access between rural and urban areas in Indonesia shows a narrowing trend over the long term. In the 2012–2016 period, the gap remained relatively stable at around 14–16 percent, reflecting significant structural inequality. Although it increased to around 14.49 percent in 2019, it has declined significantly since 2020 to 5.99 percent in 2022. This indicates accelerated internet penetration in rural areas, which are increasingly catching up with urban areas, driven by digital infrastructure development and increasing connectivity needs. Overall, this trend points to a positive convergence and serves as a crucial foundation for supporting the implementation of Smart Villages based on equitable digital access.

For comparison, Malaysia has a digital economy blueprint as a strategic framework for developing national digital transformation, as follows:

Table 2. Malaysia's Digital Blueprint

Pillar	Strategic Objective	Strategies
Public Sector	Digital Transformation	Change management; technology utilization; civil servant (ASN) skill enhancement; data utilization; improvement of digital public services
Digital Economic	Competitiveness	Business digital adoption; strengthening local participation; regulatory reform; industrial cluster development
Digital Infrastructure		Regulatory support; legacy system digitalization; infrastructure capacity enhancement
Digital Talent		Integration of digital education; competency-based orientation; workforce reskilling; gig worker protection

Inclusive Society	Digital		Enhancing inclusivity; empowerment of target groups
Safe and Ethical Digital Environment			Digital security and ethics; data protection; cross-border data transfer; business cybersecurity

Source: Economic Planning Unit, Prime Minister's Department Malaysia, 2024.

Malaysia's digital economy blueprint framework strongly correlates with the implementation of Smart Villages in Indonesia, particularly in strengthening digital governance at the village level. The pillars of public sector transformation, economic competitiveness, and digital infrastructure serve as the foundation for improving the quality of village services, developing digital-based local economies, and ensuring equitable access to technology. Meanwhile, aspects of digital talent, community inclusivity, and digital security emphasize the importance of human resource capacity, citizen participation, and adaptive regulations. Smart Villages are not simply about adopting technology, but rather a holistic integration of policy and governance [9].

METHODS

This research uses a qualitative approach with a descriptive-exploratory design to gain a deep understanding of the phenomenon under study in its natural context. The research phase begins with problem identification through initial observations and a relevant literature review, achieving a clear and directed research focus. Next, the researcher formulated open-ended and flexible research questions to explore the meanings, perceptions, and experiences of informants. The research location and subjects were selected purposively, considering the direct relationship between informants and the phenomenon under study, ensuring the data obtained has high depth and relevance [10].

During the data collection phase, this research utilized several primary techniques: in-depth interviews, participant observation, and documentation. Interviews were conducted semi-structured to provide space for exploration of informants' responses, while observations were used to capture empirical dynamics occurring in the field. Documentation served as supporting data to strengthen the research findings [11].

To ensure the validity and credibility of the data, the researcher employed triangulation techniques, including source triangulation, method triangulation, and time triangulation. Thus, the data obtained is not solely subjective from a single perspective but has undergone a process of cross-verification from various perspectives. The final stage of the research is data analysis, which is conducted interactively and continuously from the beginning of data collection. Analysis refers to the stages of data reduction, data presentation, and conclusion drawing. Data reduction is carried out by sorting and focusing information relevant to the research objectives, then presenting it in a systematic and structured narrative form [12]. Next, conclusions are drawn by interpreting the patterns, relationships, and meanings that emerge from the analyzed data, while still considering the results of triangulation to increase the validity of the findings. This process ensures that the research results have a level of validity, reliability, and analytical depth that can be scientifically justified.

RESULTS

The research findings show that the implementation of the Smart Village concept in Indonesia and Malaysia has developed with different characteristics, but shares the same goals: improving the quality of public services, empowering the local economy, and empowering digitally-based community participation. In Indonesia, Smart Village implementation tends to stem from the basic needs of village administrative services and strengthening governance transparency, while in Malaysia, it is more integrated with the national agenda of digital transformation and strengthening the community-based economy. These differences reflect the varying institutional capacity and readiness of digital infrastructure in each country [13].

In the context of digital governance, the research findings demonstrate that the success of Smart Village implementation is significantly influenced by the ability of village governments to integrate information

technology with participatory governance processes [14]. In Indonesia, limitations remain in system interoperability and human resource capacity, resulting in suboptimal use of digital platforms [15]. Conversely, in Malaysia, digital system integration is relatively more established due to the support of more structured national policies and continuous investment in technological infrastructure development.

Local community participation is a key element in the sustainability of Smart Villages [16], [17]. Research shows that community participation in Indonesia tends to increase when community-based approaches and local wisdom are implemented, such as through village deliberation forums and digital community groups. However, this participation remains volatile and depends on the role of local actors, such as village heads or technology facilitators. In Malaysia, community participation is more organized through community engagement programs facilitated by the government and non-governmental organizations. More specifically, the research findings are as follows:

Table 3. Implementation of Smart Villages in Indonesia and Malaysia

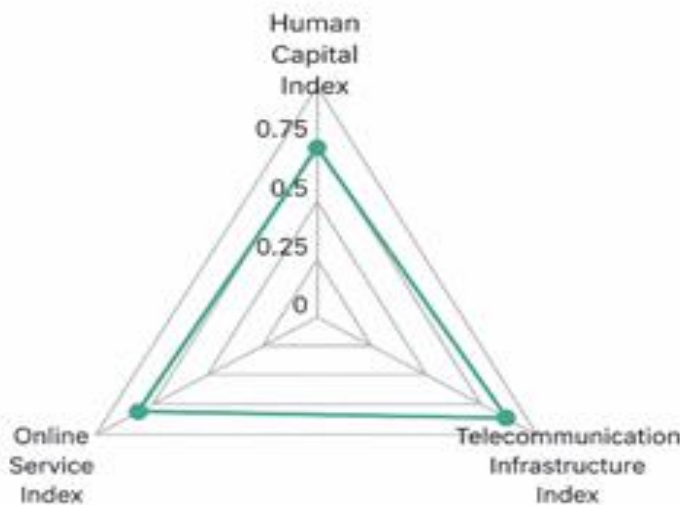
Aspect of Analysis	Indonesia	Malaysia	Comparative Analysis
Policy and Regulation	Decentralized in nature, driven by local and village government initiatives	Nationally integrated within the digital transformation agenda	Malaysia is more systematic, Indonesia is more contextual and flexible
Smart Village Implementation Model	Based on local needs (bottom-up), focusing on administrative services and transparency	Based on national policy (top-down), with integration of the digital economy sector	Indonesia is adaptive to local contexts, and Malaysia excels in standardization
Digital Infrastructure	Uneven distribution, especially in rural and remote areas	Relatively well-distributed with strong government investment support	Malaysia is more advanced in infrastructure readiness
Digital Human Resource Capacity	Still limited, dependent on training and assistance	More developed with continuous capacity-building programs	Malaysia is more advanced in human resource development
Community Participation	High but fluctuating, depending on local leadership	More structured through community programs and government facilitation	Malaysia is more stable, and Indonesia is more rooted in local wisdom
Technology Utilization	Focused on village information systems and basic public services	Broader scope, including digital economy, e-government, and smart services	Malaysia is more comprehensive in technology adoption
Local Economic Empowerment	MSMEs are beginning to digitalize but face challenges in digital literacy and market access	MSMEs are more integrated into the national digital ecosystem	Malaysia is more mature in digital economic integration
Governance	Enhances transparency, but is still weak in data management	More accountable with strong monitoring and evaluation systems	Malaysia is superior in digital accountability

Stakeholder Collaboration	Still sporadic and not yet institutionalized	Established through cross-sector strategic partnerships	Malaysia has stronger collaboration
Program Sustainability	Depends on the village government's commitment and external support	Supported by long-term policies and sustainable funding	Malaysia is more sustainable system

Source: Research Result, 2026.

In terms of economic empowerment, the implementation of Smart Villages in both countries has demonstrated a positive impact on the development of digital-based micro, small, and medium enterprises (MSMEs) [18]. In Indonesia, the digitalization of rural MSMEs still faces challenges in digital literacy and market access, despite the increasing use of local e-commerce platforms. Meanwhile, in Malaysia, training support and access to a more mature digital ecosystem have enabled village businesses to adapt more quickly to the digital economy.

Digital infrastructure is a determining factor in the success of Smart Villages. Research indicates that the gap in internet access in rural Indonesia remains a major obstacle to optimizing digital services. This results in limited public access to technology-based information and services. Conversely, Malaysia demonstrates a more equitable level of digital infrastructure, enabling the implementation of digital-based services to reach a wider and more effective community. This is relevant to Indonesia's E-Government Development Index (EGDI), which is:



Picture. 2 EGDI Indonesia 2024

Source: <https://publicadministration.un.org>, 2026.

Based on the figure, the composition of the 2024 E-Government Development Index (EGDI) is formed from three main dimensions: the Human Capital Index, the Online Service Index, and the Telecommunication Infrastructure Index. This visually demonstrates the relative contribution of each component in achieving an EGDI score of 0.7991. This score places the country at 64th place globally and falls into the Very High E-Government Development Index (VHEGDI) category with a V1 classification, indicating a high level of digital maturity in government. Compared to 2022, when it was ranked 77th, this represents a significant increase of 13 ranks, indicating progress in the development of digital services, infrastructure, and human resource capacity. In addition, the 2024 E-Participation (EPART) index of 0.7945 with a ranking of 35 also indicates strong performance in digital community engagement, although only a small increase from the ranking of 37 in 2022. Overall, this visualization confirms that the main strength lies in online services and telecommunications

infrastructure, while the human resources dimension remains a crucial factor that needs to be continuously strengthened to maintain the sustainability of digital governance transformation.

DISCUSSION

From a governance perspective, Smart Village implementation also correlates with increased transparency and accountability in village governments. In Indonesia, the use of village information systems has increased public information transparency, although challenges remain in data management and information security [19]. In Malaysia, the digital governance system has been equipped with a more systematic monitoring and evaluation mechanism, thereby minimizing the potential for abuse of authority and increasing public trust in the government.

Further analysis shows that multi-stakeholder collaboration is a crucial factor in supporting Smart Village implementation. In Indonesia, collaboration between the government, academia, the private sector, and the community remains sporadic and not yet firmly institutionalized. Meanwhile, in Malaysia, collaboration has been built within a more structured strategic partnership framework, accelerating the adoption of technology and innovation at the village level [20].

Overall, the results and discussion of this study confirm that the implementation of community-participatory Smart Villages within a digital governance framework requires synergy between institutional capacity, infrastructure readiness, and community empowerment. A comparison between Indonesia and Malaysia demonstrates that successful implementation is determined not only by technology but also by policy design, participation models, and the sustainability of the digital ecosystem at the local level. Therefore, adaptive and contextual strategies are needed to ensure that digital transformation in villages can deliver inclusive and sustainable impacts.

CONCLUSION

The conclusion of this study indicates that the implementation of community-participatory Smart Villages within a digital governance framework in Indonesia and Malaysia shares a common orientation toward improving the quality of public services, empowering the local economy, and transparency in governance, but differs in their implementation approaches. Indonesia tends to prioritize a locally based (bottom-up) participatory approach that adapts to the needs of rural communities, but still faces challenges in digital infrastructure, human resource capacity, and system integration. In contrast, Malaysia demonstrates a more structured and integrated (top-down) approach supported by national policies, more equitable infrastructure, and continuous strengthening of digital capacity. Comparatively, the success of Smart Village implementation is determined not only by the availability of technology but also by the synergy between policies, institutions, community participation, and a supportive digital ecosystem. Therefore, Indonesia needs to strengthen policy integration, equitable distribution of digital infrastructure, and human resource capacity development to enhance the effectiveness of the Smart Village program. Furthermore, good practices from Malaysia can serve as a reference in developing a more systematic and sustainable digital village governance model, while still accommodating social characteristics and local wisdom as the primary basis for community participation.

Declarations

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