

Digital Divide Mitigation Strategies in Public Services: An Analysis of the Role of the Village Community Empowerment Agency in Pekalongan Regency

Mafturrahman^{1*}, M. Al 'Amin², Husni Hidayat³, Erlin⁴, Nur Istiqlaliyah⁵

^{1,2,3,4,5} ITS NU Pekalongan, Indonesia

*Corresponding Author: mafturrahmansos@gmail.com

Article History

Received: 24-07-2026

Revised: 05-08-2026

Published: 30-08-2026

Keywords: DPMD, Village Digitalization, Digital Divide, Public Service, Pekalongan Regency

ABSTRACT

The digitalization gap in village public services within Pekalongan Regency constitutes the central urgency of this study, given the stark disparities in information access and service quality between coastal and mountainous areas. This study aims to analyze the strategic role of the Village Community Empowerment Agency (DPMD) in mitigating this divide to realize inclusive digital governance. A descriptive qualitative approach was employed through purposive sampling, involving informants from DPMD leadership and village officials. Data analysis was conducted using the Miles and Huberman interactive model, encompassing data reduction, data display, and conclusion drawing. The findings indicate that DPMD plays a vital role as a regulator through the Village Information System (SID) policy and simultaneously as an infrastructure facilitator. However, mitigation effectiveness is hampered by disparities in technological literacy among village officials, particularly in mountainous areas with limited accessibility. The study concludes that DPMD's role is critical in providing sustainable asymmetric assistance to reduce the digital divide and ensure the standardization of digital public services across all village levels.

INTRODUCTION

The acceleration of digitalization in village governance has become a national mandate to achieve efficiency, transparency, and accountability in public services. Nevertheless, the implementation of this policy at the local level frequently encounters the complex phenomenon of the digital divide. In Pekalongan Regency, digital transformation faces unique challenges due to extreme geographical disparities and significant variations in human resource capacity across village areas. The primary issue is not merely signal availability; rather, it concerns a critical policy 'blind spot' in which mountainous villages lag considerably behind in the digital readiness index, with scores falling below 1.8. If left unaddressed, this

condition will exacerbate inequalities in service access and generate public service exclusion for residents in remote areas.

The pressing research gap lies in the suboptimal mitigation models implemented by the supervising agency. Government interventions have tended to be partial, focusing exclusively on hardware procurement while neglecting the geographically-based digital literacy disparities. This study addresses this gap by proposing an asymmetric mitigation model that integrates human resource capacity building with the regulation of the Village Information System (SID)—an aspect frequently overlooked in prior rural digitalization studies. Without an asymmetric and integrated strategy, digitalization risks becoming an instrument that further widens the social marginalization gap in rural areas.

Previous research by Mafturrahman et al. (2025) emphasized the importance of administrative ethics in village services, while Soleh et al. (2024) highlighted the necessity of e-government training to enhance community participation. Nevertheless, a literature gap persists regarding how the Village Community Empowerment Agency (DPMD) specifically mitigates geographical barriers within a unified policy framework. The novelty of this study lies in its analysis of DPMD's role as a strategic facilitator that integrates technical dimensions and human resource capacity building to address digitalization barriers in mountainous areas. The proposed solution is a sustained, accompaniment-based mitigation model tailored to the typology of each village. This study aims to map the effectiveness of DPMD Pekalongan Regency's role in minimizing the digital divide to realize equitable digital villages.

METHODS

This study employs a qualitative approach with a descriptive design to comprehensively explore the strategic role of the Village Community Empowerment Agency (DPMD) in reducing digital inequality in Pekalongan Regency. Research subjects were intentionally selected through purposive sampling to ensure the acquisition of authoritative and credible data. The study involved 12 informants grouped into two primary levels:

1. **Regulatory Level (DPMD):** Comprising the head of the Village Empowerment division and technical staff responsible for managing the Village Information System (SID) who oversee district-level digitalization policy.
2. **Implementation Level (Village Government):** Involving village officials representing two distinct area typologies—coastal areas (high accessibility) and mountainous areas (low accessibility)—to empirically verify the policy's impact.

Primary data were collected through in-depth interviews guided by a structured instrument and participatory observation of digital service effectiveness at village offices. Secondary data were obtained through documentary studies of regional regulations and DPMD performance reports related to digital literacy programs. Data validity was ensured through source triangulation—by confronting regulatory statements with field realities at the

village level—and technique triangulation to align interview findings with official report documents.

The data analysis procedure follows the Miles and Huberman interactive model, operationalized through three systematic stages:

1. **Data Reduction:** Coding and focusing on findings relevant to the mitigation strategy, encompassing both infrastructure and human resource capacity dimensions.
2. **Data Display:** Organizing patterns of findings into descriptive narratives and classification tables to facilitate the identification of digitalization barriers at each locus.
3. **Conclusion Drawing and Verification:** Synthesizing field data to formulate a mitigation model adaptive to the geographical characteristics of rural areas.

RESULTS AND DISCUSSION

Field exploration revealed significant digital disparities between coastal and mountainous areas in Pekalongan Regency. This inequality is not merely an implication of geographical location; rather, it reflects structural challenges in the distribution of technology infrastructure and uneven resource allocation policies. The mapping of village digital readiness levels is presented comprehensively in Table 1.

Table 1. Classification of Village Digital Readiness in Pekalongan Regency, 2026

No	Village Classification	Digital Index Score	Readiness Criterion
1.	Digitally Independent Village	> 3.60	Highly Ready
2.	Digitally Advanced Village	2.80 – 3.60	Ready
3.	Digitally Developing Village	1.90 – 2.70	Less Ready
4.	Digitally Pioneer Village	1.00 – 1.80	Not Ready

Source: Researcher-Processed Data (2026)

Based on these readiness criteria, the actual field mapping reveals sharply contrasting disparities between downstream and upstream areas, as detailed in Table 2.

Table 2. Distribution of Village Digital Readiness by Geographical Cluster in Pekalongan Regency, 2026

N o	Geographic al Area	Digitally Indepen dent (%)	Digitally Advanc ed (%)	Digitally Developi ng (%)	Digitally Pioneer (%)
1.	Coastal Area (Downstream)	25.00	45.00	20.00	10.00
2.	Mountainous Area (Upstream)	5.00	15.00	35.00	45.00
	Regency Average	15.00	30.00	27.50	27.50

Source: Processed Secondary Data (2026)

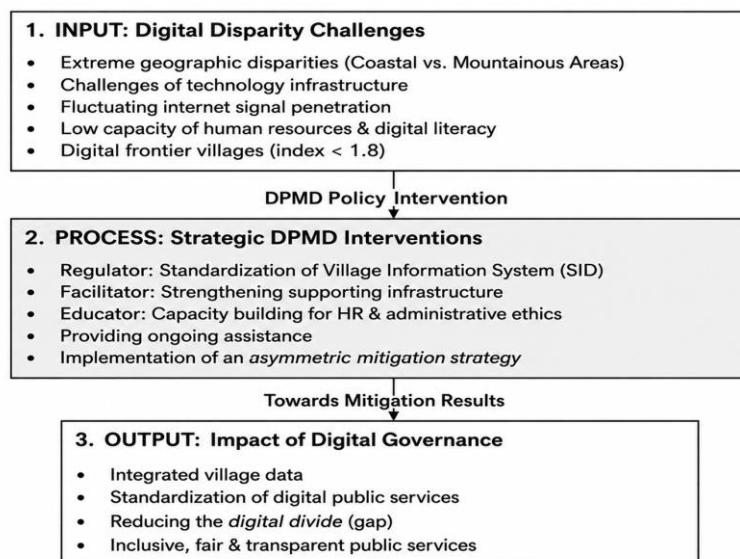
**Figure 1.** Digital Divide Mitigation Flow through Village Information System (SID) Integration

Figure 1 illustrates DPMD Pekalongan Regency's holistic mitigation model for addressing the digital divide. The flow originates from the identification of fundamental challenges, namely geographical disparities and variations in human resource capacity. In response, DPMD implements a dual strategic intervention: a regulatory function for SID standardization, and a facilitator and educator function for asymmetric infrastructure and human resource capacity strengthening. This model is designed to produce integrated data outputs that ultimately reduce the digital divide and create inclusive, equitable public services across all village areas.

Discussion

These empirical findings align with the argument of Prasetyo (2024), who posited that geographical constraints in Central Java frequently generate digital exclusion among rural communities residing in extreme topographies. This study further affirms that the primary determinant of successful digital transformation rests not merely on the availability of technical tools, but on the moral integrity and professionalism of officials in managing public data transparently. Furthermore, this analysis confirms the theory of Sofyani et al. (2021) that digital transparency is not solely a technical matter, but fundamentally one of administrative ethics, as emphasized by Mafturrahman et al. (2025). Ethics serve as a crucial foundation for preventing information asymmetry between bureaucracy and citizens amid limited physical access.

From a policy perspective, the low progress in mountainous areas is rooted in budget allocation policies dominated by physical road infrastructure development rather than investment in information systems. In this context, DPMD must transform from a mere infrastructure provider into an agent of digital cultural change at the village level, reconstructing the paradigm among village officials that digital systems constitute long-term non-physical investment assets.

A synthesis of recent studies demonstrates that transparency in village fund management through digital platforms correlates linearly with improvements in public trust. However, this finding also confronts the perspective of Nchabeleng (2025), who argued that without an inclusive literacy strategy, technology will further widen the service divide. Therefore, DPMD's mitigation must shift from mere technical assistance toward asymmetric human resource capacity building, with particular attention to areas bearing significant geographical constraints, so that digital equity may be genuinely realized.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study confirms that the role of DPMD Pekalongan Regency is a crucial instrument in reducing the digital divide through its dual function as a regulatory body for the Village Information System (SID) policy and as a facilitator for human resource capacity enhancement. Nevertheless, the effectiveness of these mitigation efforts continues to face policy blind spot challenges that have not fully addressed the fundamental issues in mountainous areas, where topographical constraints intersect with limited technological literacy among village officials. These findings affirm that the success of digital transformation in rural areas is determined not merely by the availability of physical infrastructure, but more critically by bureaucratic cultural readiness and the strengthening of administrative ethics. The sustainability of digital public service delivery at the village level depends heavily on the implementation of asymmetric mitigation strategies that prioritize

differentiated approaches and varied accompaniment intensity between advanced areas and those still at the pioneer digital stage.

Recommendations

Based on the research findings, it is recommended that DPMD Pekalongan Regency urgently formulate a comprehensive village digitalization road map that accounts for the typological characteristics of each village. Budget allocation schemes should be prioritized for intensive technical competency development programs targeting village officials in mountainous areas. Furthermore, cross-sectoral synergy with the Communication and Information Technology Agency must be optimized to ensure connectivity stability at strategic public service points. For future researchers, it is recommended to deepen the investigation into the effectiveness of incentive models for villages demonstrating sustained digital independence innovation, as well as to conduct in-depth analysis of change resistance potential through the lens of organizational psychology within the village governance context.

REFERENCES

- Almarashdeh, I., & Alghushami, A. H. (2024). Digital transformation in the public sector: A review of the barriers and enablers. *Journal of Public Administration and Governance*, 14(1), 88–105.
- Aziz, Z. R., & Kholmi, M. (2024). The effect of green accounting and corporate social responsibility on profitability: An empirical study of energy companies in the mining subsector listed on the Indonesia Stock Exchange during 2019–2021. *Jurnal Ekonomi Akuntansi dan Manajemen (JEAM)*, 23(1), 54–63.
- Chen, X., Cheng, X., Zhang, T., & Guo, H. (2024). How do information and communication technology platforms shape rural e-governance? The case of Zhao-Lou Village on the WeCounty platform. *Information Systems Journal*, 35(2), 545–576.
- Fadillah, Y., Suryani, E., & Rofieq, A. (2025). Administrative governance in Karangmulya Village: Challenges and solutions in Bojongmangu District. *An-Nizam*, 3(3), 224–231.
- Fadrial, R., Sujianto, S., Simanjuntak, H., & Wirman, W. (2024). A qualitative study on the influencing factors of e-government adoption to improve public trust in local government: Case study of Rokan Hulu Municipality. *Indonesian Journal of Computer Science*, 13(3).
- Failin, I., Hamdun, E., & Ariyantiningih, F. (2023). The effect of work discipline and work motivation on the performance of village officials through job satisfaction as an intervening variable at village offices in Banyuputih District, Situbondo Regency. *Jurnal Mahasiswa Entrepreneurship (JME)*, 2(6), 1145.
- Gunawan, R., & Hartono, B. (2024). Digital literacy strategies for village officials in facing the Industry 4.0 era. *Jurnal Inovasi Pemerintahan*, 9(1), 12–25.
- Hidayati, S., Netti, H., & Adrianto, A. (2024). Public services provided by village officials at the Sungai Rambai Village Office, North Pariaman District. *Jurnal Pemerintahan dan Kebijakan (JPK)*, 5(2), 91–100.

- Husni, M., Damayanti, R., & Indrijawati, A. (2023). The role of village government performance and transparency in influencing village public trust. *Journal of Accounting and Investment*, 24(2), 450–461.
- Ismanto, S. D. (2024). The digital infrastructure access gap in rural Indonesia: Public policy challenges. *Jurnal Administrasi Negara*, 15(2), 201–218.
- Junaedi, J. (2023). Implementation of village governance based on the principles of good governance in public services in Indonesia. *International Journal of Business Law and Education*, 4(1), 249–266.
- Kurniawan, D. (2024). Change management analysis in the adoption of information technology at the village level. *Jurnal Tata Kelola*, 6(3), 88–102.
- Mafturrahman, M., Muafiq, F., Anjani, A. D., Lestari, B., & Melindasari, P. (2025). Analysis of the implementation of administrative ethics in village public services at the Proto Village Office, Kedungwuni District, Pekalongan Regency. *Empiricism Journal*, 6(3), 953–964. <https://doi.org/10.36312/ej.v6i3.3342>
- Maulana, A., & Saputra, H. (2025). The integration of the Village Information System (SID) in strengthening public information transparency. *Jurnal Ilmu Sosial dan Politik*, 11(1), 45–59.
- Nchabeleng, P. (2025). Examining the challenges faced in service delivery by South African rural communities after 28 years of democratic government administration. *E-Journal of Humanities, Arts and Social Sciences*, 983–996.
- Nuryan, K., Rafiyandi, M., & Rahim, E. (2022). Influence of employee work discipline on community satisfaction at the Lengkong Village Office, Bojongsoang District, Bandung Regency. *JICA*, 1(2), 61–66.
- Padilah, A., Alamri, A., Apriyani, E., & Rudiyanto, Y. (2023). Enhancing rural community development through political transparency. *Komunitas*, 14(2), 154–175.
- Prasetyo, T. (2024). Geographical constraints and the digital divide: A case study of public service delivery in Central Java. *Jurnal Geografi Publik*, 8(2), 112–127.
- Sofyani, H., Pratolo, S., & Saleh, Z. (2021). Do accountability and transparency promote community trust? Evidence from village government in Indonesia. *Journal of Accounting & Organizational Change*, 18(3), 397–418.
- Soleh, M., Ikhwaningrum, D., Ayuni, S., Putra, M., Firmanto, B., & Refangga, G. (2024). E-government training to increase community participation. *E-Dimas: Jurnal Pengabdian kepada Masyarakat*, 15(2), 397–402.
- Sudaryanto, B. (2024). The role of leadership in mitigating resistance to digital transformation in rural areas. *Jurnal Pengembangan Desa*, 12(4), 310–325.
- Syadiyah, K., Putri, S., & Hayat, H. (2024). The role of public administration ethics in realizing clean and transparent governance. *Jurnal Ilmu Administrasi Negara (JUAN)*, 12(1), 116–124.
- Utami, W. R. (2025). Village digitalization: Between regulatory demands and the reality of human resource competencies. *Jurnal Kebijakan Publik Indonesia*, 7(2), 154–169.
- Wicaksono, A. (2024). Evaluation of village digital transformation policies at the district level. *Jurnal Administrasi Terapan*, 10(1), 33–47.

- Yaya, R. (2025). The effect of e-government implementation and community participation on village government performance, with good governance as a moderating variable. *Balance: Jurnal Akuntansi dan Bisnis*, 10(1), 69–81.