



## The Role of Digital Technology in Enhancing Human Resource Management in Village Government : A Literature Review

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**Abstract** Digital transformation in village governance has become a primary strategy for enhancing efficiency and effectiveness in human resource (HR) management. This study aims to analyze the implementation of digital technology in village government HR management and its impact on productivity and administrative efficiency. Employing a systematic literature review method, this research examines implementation trends, success factors, challenges, and optimal strategies for digitalization in HR management at the village level. The findings indicate that the adoption of technologies such as electronic Human Resource Management (e-HRM), cloud computing, and village information systems contributes to faster administration, increased accountability, and optimized performance of village officials. However, challenges remain in technology adoption, including low digital literacy among village officials, limited information and communication technology (ICT) infrastructure, as well as regulatory and policy constraints. To overcome these hurdles, a comprehensive strategy is required, encompassing capacity building through training, strengthening digital infrastructure, and fostering collaboration among central government, village governments, and the private sector. With appropriate policy implementation, the integration of digital technology in village-level HR management can improve public service quality and support more modern and responsive governance.

**Keywords:** Digital Transformation, HR Management, Governance, Village, Efficiency

### 1. INTRODUCTION

Digital transformation in public administration—particularly at the village governance level—has emerged as a strategic issue in enhancing bureaucratic efficiency and public services in Indonesia. The goal of digitalization extends beyond merely automating administrative processes; it also seeks to promote transparency and increase community participation in village governance. Several studies have indicated that the use of digital technologies, such as official websites and social media, can heighten community engagement in village governance processes, contributing to more responsive and inclusive governance (Karinda et al., 2024; Noersyahbani et al., 2023). One concrete form of digital transformation at the village level is the implementation of a Village Information System (VIS), which enables more efficient data storage and management. Although some regions still face challenges in VIS implementation, its successes have been demonstrated by the accelerated administrative processes and improved public services (Saputra & Tukiman, 2024; Sihotang et al., 2023). Furthermore, the sustainability of digital transformation at the village level relies heavily on improving digital literacy among village officials and providing adequate information technology infrastructure (Majapahit, 2023; Raharjo et al., 2023).

The urgency of integrating digital technology into village governance is also tied to the growing demand for faster and more effective public services. Initiatives such as Digital Village

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and Smart Kampung have been developed in various regions to expand access to digital services for local communities. For instance, Banyuwangi's Smart Kampung policy has illustrated how technology can be used to streamline administrative services, accelerate decision-making, and expand service outreach (Yunas, 2023). Nonetheless, not all Indonesian villages are prepared to adopt digital technology because of structural barriers, such as limited internet access and a lack of awareness about the benefits of digitalization (Ibrahim et al., 2023; Manoby et al., 2021). Therefore, a comprehensive strategy is needed to expedite digital transformation in village governance, including in human resource (HR) management.

In the context of HR management in the public sector, digital technology plays a crucial role in enhancing the efficiency and effectiveness of village officials. The use of digital-based HR management information systems enables more systematic management of personnel data, including recruitment, training, performance evaluation, and administrative management. Studies have revealed that employing information technology in public sector HR management can increase productivity and drive efficiency in decision-making (Arianto & Susetyo, 2022; Nisa, 2024). Additionally, digital-based training is essential for improving village officials' competencies, particularly in tackling the challenges of digitalizing public administration (Hamsal, 2024).

Despite the proven benefits of digital technology in public sector HR management, Indonesian village governments continue to face multiple challenges in its adoption. One key obstacle is the still low level of digital literacy among village officials, hampering the optimal use of digital systems in HR administration (Fakhrurrazi et al., 2022; Hamsal, 2024). Resistance to change is another barrier, as many local officials remain accustomed to conventional methods of managing HR (Nursin et al., 2022; Yuliawati, 2023). Furthermore, limited infrastructure—such as uneven internet access and inadequate technological devices—presents a significant challenge for digital transformation in village governance (Fuad, 2023; Putrawan et al., 2021). In addition, existing regulations do not fully support the implementation of digital systems at the village level, further slowing the pace of technological adoption in HR management (Arma, 2023; Rustandi, 2019). Consequently, more adaptive, locally relevant policies are required to ensure optimal digitalization outcomes.

Various studies have examined the application of digital technology in public sector HR management, both globally and in several parts of Indonesia. Best practices suggest that successful digitalization is contingent on synergy among policy strategies, infrastructure readiness, and enhanced capacity to adopt digital technology. For example, the introduction of digital-based information systems in some countries has improved administrative efficiency

and transparency in public sector HR management (Frinaldi et al., 2023; Latupeirissa, 2024). Similarly, digital technologies in HR systems can help optimize recruitment and training processes, ultimately boosting organizational performance (Fan, 2023). Several regions in Indonesia have also successfully developed digital-based systems for managing village officials, such as e-government platforms that strengthen transparency and enhance the efficiency of public services (Ha & Chuah, 2023; Najaf, 2023).

However, while various studies have investigated the advantages of digital technology in the public sector, research specifically addressing its impact on productivity and efficiency among village government HR remains limited. Most existing research focuses on the technical aspects of digital system implementation, whereas factors pertaining to the success and constraints of digital technology adoption in villages have not been extensively explored (Ha & Chuah, 2023; Latupeirissa, 2024). Hence, a literature-based approach that identifies implementation patterns and factors contributing to successful digitalization in village government HR management is urgently needed.

This study aims to comprehensively examine the impact of integrating digital technology into the HR management of village governments, with particular emphasis on village officials' productivity and efficiency. Using a literature-based methodology, the research identifies key factors in digital system adoption and investigates potential challenges during implementation. The findings are expected to yield evidence-based recommendations for village governments in maximizing the use of digital technology in HR management. Moreover, this study contributes to the development of technology-based HR management models in the public sector that may serve as references in designing future digitalization strategies for village governance.

## **2. RESEARCH METHOD**

This study employs a systematic literature review approach to analyze the integration of digital technology in human resource (HR) management within village governments. The literature review method was selected because it enables researchers to identify trends, challenges, and solutions that have been implemented in previous studies. Through this method, the study provides a comprehensive understanding of the factors influencing successful digital transformation in public-sector HR management at the village level.

Data were gathered from various relevant secondary sources, including scholarly journals, government policy reports, and case studies discussing digital technology implementation in village governance. These sources were retrieved through systematic

searches in academic databases such as Google Scholar, Scopus, and ScienceDirect, as well as from government and non-governmental organization publications focusing on public-sector digitalization. To ensure validity and relevance, only literature published within the last five years was included, except for some seminal works still deemed theoretically relevant to this study.

The selection criteria for the literature in this study were based on their relevance to the topic of integrating digital technology into the HR management of village governments. Selected articles were required to address aspects of digital technology adoption in public-sector HR governance, including associated challenges and obstacles, as well as strategies aimed at improving the effectiveness of technology utilization. Studies that solely discussed technical issues without linking them to policy or HR management were excluded. Likewise, research focusing exclusively on the private sector without relevance to the public sector was also omitted.

Data analysis was performed through content analysis, classifying literature findings according to major themes such as digital technology implementation trends in village government HR, its impact on productivity and efficiency, success factors for technology adoption, and challenges encountered in its application. Findings from multiple studies were compared to identify patterns, research gaps, and strategic recommendations that could be adopted in the Indonesian village governance context. This analysis also referenced digital transformation models from previous literature to assess the extent of technology adoption in village governance.

To enhance the objectivity of the findings, the study employed source triangulation by comparing results obtained from academic journals with government policy reports and field case studies. Through this approach, the research provides not only an academic overview but also practical insights into how digital technology can be effectively deployed in village government HR management. The findings from this approach aim to yield evidence-based recommendations that can be applied to governance policies in village administrations.

### **3. RESULTS AND DISCUSSION**

#### **Trends in Digital Technology Implementation in Village Government HR Management**

Implementing digital technology in the human resource (HR) management of village governments is a vital step toward boosting efficiency and effectiveness in managing human capital. This digital transformation covers various facets, including recruitment, training, financial management, and village information systems. Within this context, training and

competency development for human resources emerge as critical, particularly in the digital era that demands rapid adaptation to new technologies. Hamsal (2024) underscores the importance of HR management training in the digital era to enhance the quality and competitiveness of local businesses, including micro, small, and medium enterprises (MSMEs) in rural areas. Moreover, Putro (2024) shows that the application of digital technology in different aspects of HR management—such as digital-based personnel management and performance evaluation systems—can significantly boost productivity.

A well-devised HR management strategy is crucial for tackling challenges in the era of Industry 4.0. Marthalia (2023) reveals that the digital gap stemming from limited knowledge among HR personnel in optimizing digital technology must be addressed through systematic strategies. This aligns with findings from Bantara (2024), highlighting the essential role of village governments in supporting digital transformation, notably in managing Village-Owned Enterprises (BUMDes). With appropriate strategies, BUMDes can serve as an engine for more inclusive and sustainable rural economic development.

In the context of village financial management, digital technology implementation has also shown positive outcomes. Anan (2024) describes how digital financial management training for BUMDes members can enhance operational efficiency and expedite financial administration processes. Similarly, Nursin et al. (2022) find that leveraging information technology in internal control systems significantly affects village financial management. Consequently, integrating digital technology into rural financial systems can improve transparency and accountability—essential elements of robust HR management.

A holistic approach is necessary to ensure that digital technology adoption is effectively executed in village governments. Fathurohman and Erdi (2022) explain that a digital-based Village Information System can foster better communication between village authorities and local communities, increase openness in administrative processes, and accelerate public services. Additionally, Nurlita (2023) emphasizes that digital transformation in managing public health data can serve as a model adaptable to HR management systems in villages.

### **Impacts of Digital Technology Integration on HR Productivity and Efficiency**

The integration of digital technology in village government human resource (HR) management has substantially boosted productivity and efficiency among village officials. The use of information and communication technology (ICT), such as electronic Human Resource Management (e-HRM), cloud computing, and big data, streamlines various administrative HR tasks, making them faster, more accurate, and more transparent. By adopting digital technology, administrative tasks previously performed manually can now be automated, reducing labor

hours while enhancing the efficacy of public service delivery (Kabul, 2024; Widjaja & Wijayadne, 2022).

One major benefit arising from digital integration is improved administrative efficiency in HR processes. e-HRM systems, for example, facilitate online employee data management, performance evaluation, and recruitment systems, minimizing human errors and accelerating administrative workflows (Widjaja & Wijayadne, 2022). Digital systems also reduce reliance on paper-based documents in HR management, shrinking archive volumes and expediting data searches. Moreover, cloud computing solutions offer flexible and secure data access, thus hastening decision-making in village government HR management (Barus et al., 2024).

Digital technology also enhances village officials' productivity. According to Imaduddin et al. (2024), the adoption of Industry 5.0 technologies—merging Artificial Intelligence (AI) and the Internet of Things (IoT)—mitigates human errors in administration and boosts operational efficiency. Automated systems enable village officials to concentrate on more complex, high-value tasks such as rural development planning and improving public services. Additionally, digital technology supports real-time performance monitoring, which fosters accountability and encourages a more productive work culture.

Digital-based training and capacity-building are also pivotal for augmenting productivity. Nurhabibah (2023) highlights that competency-based training aligned with technological advances significantly affects the performance of village officials. Ongoing training initiatives help employees swiftly adapt to digital systems and understand the operational mechanisms of newly integrated technologies. Holy et al. (2023) further assert that village officials with a strong grasp of digital skills tend to be more productive and better equipped to handle digital transformation challenges.

Within the context of micro, small, and medium enterprises (MSMEs) collaborating with village governments, digital integration similarly fortifies competitiveness and operational efficiency of local enterprises. Hamsal (2024) shows that digital-based HR management training for MSMEs amplifies business productivity and expands market reach through online platforms. Consequently, the application of digital technology in HR management not only optimizes internal processes in village governments but also contributes to local economic empowerment.

In conclusion, integrating digital technology into village government HR management yields significant gains in productivity and efficiency. From automated administration and streamlined data access to digital-based training programs, the advantages of digitalization are evident. A well-structured implementation strategy, coupled with multistakeholder support, is

essential to sustain and broaden the positive impacts of digital technology adoption in village governance.

### **Key Success Factors for Digital Technology Implementation**

Several interconnected factors—technological, human, and organizational—determine the success of digital technology adoption in managing human resources (HR) within village governments. Each factor holds a pivotal role in ensuring that technology implementation progresses smoothly and delivers maximum benefits for the efficiency and productivity of village officials.

From a technological standpoint, system quality, reliable digital infrastructure, and user accessibility are critical. Roaini (2022) underscores that successful technology adoption in the public sector largely hinges on robust infrastructure and user-friendly information systems. Additionally, ongoing vendor support and solid system maintenance are essential to ensure seamless operation of digital technology in village governments (Rahmawati & Nugroho, 2020). Thus, enhancing the quality of local information and communication technology (ICT) systems must be a priority in accelerating digital transformation in HR management.

Human factors also significantly influence digital technology adoption. The competency of village officials in operating digital-based systems is particularly crucial for long-term success. Ayu (2023) notes that the effectiveness of digital transformation depends on the level of digital literacy among employees and the tangible benefits they derive from using such technology (Ayu, 2023; Guampe et al., 2022; Guampe, Rosidah, et al., 2023). Burhan and Nadjib (2023) likewise emphasize the importance of structured training and ongoing technical guidance to maximize digital technology use among village officials. Without adequate human resource readiness, the digitalization of HR management in village governments can be hampered by obstacles such as change resistance and underutilization of available technologies (Guampe, 2024).

On the organizational side, strong executive support—particularly from village heads and other key officials—significantly boosts technology adoption in village governance (Rahmawati & Nugroho, 2020). Explicit policy backing and a long-term digital management strategy are necessary for sustaining the digital transformation process. Furthermore, Gusman et al. (2021) highlight the importance of cultivating an organizational culture that fosters digital innovation and a conducive work environment as critical factors in shaping an adaptable digital ecosystem.

Overall, the success of digital technology implementation in village government HR management is not solely a technical matter; it also hinges on the readiness of human resources

and robust organizational support. A holistic approach that integrates technological, human, and organizational dimensions is vital for ensuring effective digitalization of HR management and delivering lasting positive outcomes.

### **Challenges and Obstacles in Digital Technology Adoption**

The adoption of digital technology in human resource (HR) management within village governments encounters multiple hurdles that can impede its effectiveness. These challenges stem from technical barriers, inadequate human resource readiness, policy and regulatory constraints, as well as social and cultural factors influencing technology acceptance.

One major obstacle is the low level of digital literacy among village officials and the general public. Windiarti et al. (2023) highlight that the lack of understanding of generative AI and other digital systems hampers administrative digitalization in village governments. Many village officials remain reliant on manual methods of HR management, leading to resistance and difficulties during digital adoption. Limited training opportunities and poor awareness of the benefits of digital technology exacerbate this situation (Sarjito, 2023). Consequently, long-term and well-structured capacity-building initiatives are required to enable village officials to adapt to newly implemented digital systems.

Another critical barrier is the lack of robust information and communication technology (ICT) infrastructure in many rural areas. Although digitalization in the public sector continues to progress, disparities persist in internet connectivity, technology hardware availability, and other supporting systems, particularly in resource-constrained regions (Prihartono & Tuti, 2023). Inadequate internet coverage and outdated devices limit the optimal use of digital HR management information systems. Without proper infrastructure, digital technology adoption remains unsustainable and inaccessible to all village officials.

Data security and privacy also pose significant concerns when implementing digital technologies. In digital-based HR management systems, personal employee data and other administrative records must be safeguarded from leaks and misuse. Febrian (2024) indicates that protecting information and maintaining high-level security in big data systems is a principal challenge in the public sector. Without robust data protection measures, potential breaches could undermine public trust in the government's digital systems.

Furthermore, policy and regulatory frameworks that are not fully supportive add to the complexities of digitalization in village HR management. Although the central government has enacted various policies to facilitate digital transformation in rural areas, local-level implementation often hits roadblocks. Some villages struggle to align these policies with local needs, while complex bureaucratic processes impede the swift adoption of digital technology



(Prihartono & Tuti, 2023). A more flexible approach to digital policy is needed to accommodate each village's unique conditions and requirements.

Social and cultural factors also play a role in limiting the adoption of digital technology in village governance. Certain local officials and community members remain attached to traditional methods, perceiving digital systems as more complicated and user-unfriendly (Sarjito, 2023). Such perceptions hinder the motivation to acquire new technological skills. Therefore, effective communication strategies and extensive outreach are necessary to help community members and village officials recognize the advantages of digitalization and gain confidence in using these new tools.

In summary, challenges in implementing digital technology within village governments arise from low digital literacy, inadequate infrastructure, data security issues, unsupportive regulations, and cultural resistance to change. A holistic solution—encompassing infrastructure investment, long-term training, and adaptive policies—must be pursued. By tackling these barriers head-on, digital transformation in village HR management can progress more effectively, ultimately enhancing the efficiency and quality of public services.

### **Strategies to Enhance Digital Technology Adoption in Village Governments**

Improving the adoption of digital technology within village governments is crucial for modernizing public services and managing human resources more effectively. Several strategies can be employed to achieve this goal, including enhancing digital literacy, developing ICT infrastructure, conducting effective outreach and training, and promoting collaboration among government entities, communities, and the private sector.

One primary strategy is to strengthen digital literacy among both village officials and local residents. Adequate digital literacy enables individuals to effectively understand and use information technology in their daily tasks. Husen (2024) emphasizes that bolstering digital literacy can unlock opportunities and improve the welfare of rural communities. Structured and ongoing training for village officials is essential to ensure they can operate digital information systems effectively. Handayani (2023) describes how introducing an information system in Desa Klambir Lima Kebun improved overall administrative efficiency, eventually enhancing the effectiveness of village officials.

Another strategy involves upgrading information and communication technology (ICT) infrastructure. Stable internet access, sufficient hardware (e.g., computers and servers), and robust data security systems are prerequisites for successful digitalization in village governments. Putri (2024) observes that expanding internet connectivity—such as in Desa Permisan—significantly accelerates digital administrative processes at the village level.

Consequently, both central and local governments should invest in building ICT infrastructure to ensure all villages can access adequate technology.

Additionally, effective outreach and training on digital technology utilization can significantly boost adoption rates in village governments. Pattisahusiwa (2024) shows how outreach programs on using digital platforms in Desa Lekaq Kidau improved MSME operators' understanding of technology, thereby enhancing the competitiveness of local products. In a similar context, practical, locally oriented training programs can help village officials become more adept at harnessing the digital systems they implement, thereby increasing their confidence and competence in using these tools.

Collaboration among village governments, local communities, and the private sector is also critical for expediting digitalization efforts. The Smart Village concept, integrating digital technology into village governance, demonstrates that multi-stakeholder involvement can yield innovative, sustainable solutions (Nuraini et al., 2021). For instance, village governments can partner with technology firms or universities to provide training and mentoring that optimizes digital technology usage among village officials. Community engagement should also be encouraged so digital systems are not limited to administrative functions but also extend to providing online public services to residents.

Finally, supportive regulations and policies from the central government play a pivotal role in ensuring that digitalization at the village level proceeds smoothly. Eprilianto et al. (2020) assert that digitalization policy effectiveness in the public sector hinges on coordination between central and local governments, ensuring that regulations are adaptable to diverse village conditions and needs. Clear policies governing the use of digital technology in village HR management—such as standard operating procedures (SOPs) and data protection measures—are essential for establishing a secure and sustainable system.

In summary, strategies to elevate digital technology adoption in village governments should be multifaceted, including digital literacy improvements, infrastructural investments, effective outreach and training, cross-sector collaboration, and adaptive policy support. When systematically executed, these strategies can equip Indonesian villages to navigate digital transformation successfully and enhance efficiency and service quality at the village level (Guampe, Kundhani, et al., 2023; Guampe, Rosidah, et al., 2023).

#### **4. CONCLUSION**

This study highlights the integration of digital technology in the human resource (HR) management of village governments as a strategic initiative aimed at enhancing administrative

efficiency, raising village officials' productivity, and promoting transparency in governance. Through a systematic literature review, the findings indicate that digital technologies—such as electronic Human Resource Management (e-HRM), cloud computing, and village information systems—significantly simplify administrative processes, accelerate decision-making, and improve accountability in managing village government HR.

Despite the clear advantages of digital technology, several challenges persist in its implementation within village governments. Limited digital literacy among village officials, inadequate information and communication technology (ICT) infrastructure, as well as regulatory and policy hurdles pose significant barriers to digitalization. Resistance to change and concerns regarding data security further impede the widespread adoption of digital systems. Consequently, a comprehensive strategy is imperative to optimize digital transformation in HR management.

Potential strategies include advancing digital literacy for village officials through continuous training, enhancing ICT infrastructure, and formulating policies that are more adaptive to rural needs. Moreover, collaboration among central government, local authorities, private sector entities, and local communities is essential in expediting digitalization. The Smart Village concept, which integrates technology into village-level governance, can serve as an effective model for ensuring the sustainability of digital technology adoption in rural public sectors.

In conclusion, integrating digital technology in HR management at the village government level has the potential to substantially improve governance efficiency and effectiveness. Success hinges on infrastructure readiness, human resource development, and robust, long-term policy support. When these elements are properly addressed, digitalization in village governance can act as a catalyst for elevating the quality of public services and empowering local communities, ultimately paving the way for more modern and responsive public administration.

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