

OPTIMIZATION OF TECHNOLOGY IN THE DEVELOPMENT OF CITENGGAH VILLAGE

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Abstract

Citengah Village in Sumedang Selatan District has great potential in sustainable development, especially through the use of digital technology. This study aims to analyze the readiness of Citengah Village in implementing technology, identify the main obstacles, and formulate appropriate technology optimization strategies. Using the Smart Village approach, which emphasizes the integration of technology to improve the efficiency of village governance, this study also utilizes the theory of development administration as an analytical framework to measure transparency, participation, and accountability in village development. The results of the study indicate that Citengah Village has a strategic vision for digitalization through the RPJMDs, but limited digital infrastructure, low technological literacy of village officials, and limited budget are the main obstacles. The proposed strategies include strengthening internet infrastructure, intensive training for village human resources, and collaboration with external parties to support funding and technology. This study emphasizes the importance of the relationship between the Smart Village approach and development administration. Technology not only improves the efficiency of public services but also supports more inclusive and accountable village governance. By implementing this optimization strategy, Citengah Village has the potential to become a model of a technology-based village that is able to answer community needs in a sustainable manner.

Keywords: Technology, Smart village, Development Administration, Citengah Village

A. INTRODUCTION

Citengah Village, located in Sumedang Selatan District, is a village with an area of 3,030 ha and has various potential natural, social, and cultural resources that can be optimized for sustainable development. Based on data from the 2019-2024 Citengah Village RPJMDs, this village is divided into two development areas, namely Citengah Hamlet and Cijolang Hamlet, with a total population of 1,701 people. The main potential of the village lies in the agricultural sector, supported by hilly topography with an annual rainfall of 2,500 mm, which creates a fertile environment for agricultural and plantation activities. However, Citengah Village faces a number of challenges, such as limited digital infrastructure, low levels of education (the majority of residents only graduated from elementary school), and minimal public facilities such as toilets, clean water, and adequate road access. Other challenges include the limited capacity of human resources of village officials in the use of information technology, which has an impact on delays in public services and village administration management.

In this context, technology optimization becomes an important strategy to support village development, especially through the Smart Village approach. The Smart Village

concept emphasizes the use of digital technology to improve the efficiency of public services, community empowerment, and intelligent management of village resources (Arnstein, 1969). Key elements of Smart Village include digital infrastructure, reliable connectivity, and technology applications to support transparent and inclusive village governance (Jacob et al., 2023). The implementation of Smart Village in Citengah Village, for example through the provision of village internet and technology-based public information systems, can overcome infrastructure limitations while increasing community participation in development (Castells, 2011).

Optimization of technology is also in line with the theory of development administration which emphasizes the principles of transparency, participation, accountability, and efficiency (Yunus & Nasution, 2022). In development administration, technology plays a role as a tool to increase the capacity of village institutions and empower local communities (Kaseng, 2023). The use of technology enables the village government to carry out administrative functions better, such as in budget preparation, population data management, and performance reporting. This supports the realization of good village governance which is the main goal in development administration (Helmi et al., 2024).

The main novelty in this study lies in the integration of the Smart Village approach with development administration in the context of developing villages, specific digital readiness analysis, identification of unique constraints that have not been widely discussed, optimization strategies based on multi-party collaboration, and more concrete policy recommendations (Putra & Pramana, 2023). By making these aspects the main focus in journal publications, this study can make a significant contribution to academic literature and policy implementation in the field of technology-based village development (Ammar et al., 2024).

B. LITERATURE REVIEW

Optimization of technology in village development is closely related to the concept of Smart Village and the theory of development administration (Haning, 2018). Smart Village emphasizes the use of digital technology to overcome infrastructure limitations, improve governance efficiency, and empower communities. According to this theory, the integration of technology such as village information systems, digital platforms for public services, and internet access can support villages in managing their resources more intelligently and transparently (Banerjee & Duflo, 2019).

Meanwhile, development administration focuses on the principles of transparency, participation, and accountability (Dwiyanto, 2021). Digital technology plays a strategic role in creating good village governance by increasing the speed and accuracy of administration. In the context of Citengah Village, the implementation of technology can assist in the management of the RPJMDes, the preparation of data-based budgets, and the improvement of public services in an inclusive manner (Ogryzek et al., 2021).

Previous studies have shown that villages that successfully adopt the Smart Village approach experience improvements in administrative efficiency and local economic competitiveness (Nursetiawaaan, 2020). However, challenges often arise, such as low technological literacy among village officials and limited budget for digital infrastructure procurement. This is relevant to the conditions of Citengah Village, where programs such as village internet procurement and village official training are priorities in the RPJMDes, but their implementation still faces obstacles.

C. RESEARCH METHODOLOGY

This study uses a qualitative descriptive approach, with secondary data analysis from the RPJMDes of Citengah Village and interviews with village officials as primary data (Saadah et al., 2022).

D. RESULT AND DISCUSSION

Readiness of Citengah Village in Implementing Technology

The readiness of Citengah Village in adopting technology can be seen through three main dimensions: infrastructure, human resources, and strategic planning. Based on the RPJMDes, this village has a strategic plan to provide internet access through a village internet procurement program. However, until now, internet access has only been available at the village office, while most areas have not been reached by the network. The hilly topography and an area of 3,030 ha are the main challenges in building digital infrastructure. In terms of human resources, the majority of village officials have low technological literacy. This can be seen from their limitations in using administrative software or applications that support village governance. The village official training program planned in the RPJMDes is an important step to increase human resource capacity, but its implementation has not been optimal.

Strategic planning through the RPJMDes shows the village government's awareness of the importance of technology to support governance and public services (Dwiyanto, 2021). However, this plan requires adequate funding and a strong commitment to implementation. The readiness of Citengah Village is in its early stages, with great potential to grow if the strategic plan can be realized.

Technology Implementation Constraints

The implementation of the Smart Village approach in Citengah Village faces a number of interrelated obstacles, ranging from infrastructure, human resources, to funding (Herdiana, 2019). These three aspects are determining factors for success in the digital transformation of the village, but currently still require strategic intervention to maximize its potential.

Limited Infrastructure

The village internet procurement plan stated in the RPJMDes reflects initial efforts to improve digital connectivity. However, data shows that the internet network is only available in the village office area, while most of the village area has not been reached. The hilly topography of Citengah Village and its area of 3,030 hectares are significant technical challenges. This not only hampers the operation of village officials, but also reduces the community's opportunities to utilize technology, such as for online education, access to digital health services, or daily communication.

This infrastructure limitation also has an impact on the efficiency of public services. The village administration process which is still carried out manually slows down services to the community. For example, residents who need certain documents must come directly to the village office because there is no supporting online system. This shows that adequate digital infrastructure is an absolute requirement to start a technology-based transformation in Citengah Village.

Human Resource Capacity

In addition to infrastructure constraints, the level of technological literacy of village officials is also a major challenge. Based on the evaluation, the majority of village officials are not yet skilled in using village information systems or other digital applications. Although hardware such as computers are available in the village office, the lack of training means that

their utilization is not optimal (Agusman et al., 2025). This condition is exacerbated by an unsustainable training pattern. Most village officials only undergo basic technology training, without follow-up to ensure that their skills continue to develop. As a result, the potential of the available technology is often not used optimally. For example, population data management that should be automated through applications is still done manually, increasing the risk of administrative errors and slowing down services.

Limited Funding

Budget constraints are another major obstacle. Most funding for village development, including digitalization, comes from village funds that must be allocated for various other priority needs. In the RPJMDes, the budget for digitalization programs such as village internet procurement and technology training has been proposed, but its realization is often delayed because more funds are allocated for physical development such as road repairs and toilet facilities. In addition, alternative funding sources, such as collaboration with the private sector or donor institutions, have not been utilized optimally. In fact, this partnership model can open up opportunities to obtain technological assistance or training for village officials. For example, telecommunications companies can provide CSR programs in the form of installing BTS towers or subsidizing internet services.

The above obstacles illustrate how Citengah Village is in a transition phase towards digitalization. Limited infrastructure, unskilled human resources, and minimal budget are fundamental problems that require integrated solutions. The Smart Village approach not only offers opportunities to overcome these obstacles but also paves the way for more inclusive development.

Through strengthening infrastructure, empowering human resources, and funding collaboration, Citengah Village can realize technology-based village governance that is in line with the principles of development administration. Technology is not only a tool for efficiency, but also a medium to increase transparency, participation, and accountability in village management, this confirms that the obstacles faced by Citengah Village are opportunities for the implementation of innovative technology-based strategies to accelerate sustainable village development.

Technology Optimization Strategy

In an effort to overcome the obstacles to technology implementation, Citengah Village requires an integrated strategy that is oriented towards local needs. This strategy does not only focus on technology procurement, but also on community empowerment and multi-party collaboration. With a comprehensive approach, technology can be a catalyst to accelerate village development, improve governance efficiency, and encourage community participation.

Strengthening Digital Infrastructure

The first and most basic step is to ensure the availability of adequate internet networks throughout the village (Dedrick et al., 2003). Currently, internet access is only available in the village office, which limits village officials in carrying out administrative tasks efficiently. One solution is to expand internet coverage by building BTS towers in strategic locations, especially in areas with high populations and active economic activity. This development can be done through partnerships with telecommunications service providers, where villages can offer land locations as assets for infrastructure development at more affordable costs. In addition, utilizing government subsidies in village digitalization programs or CSR (Corporate Social Responsibility) programs from technology companies can help overcome budget constraints. Community-based networks, such as inter-regional internet sharing, can also be a temporary solution to improve connectivity in remote areas.

Pelatihan dan Pemberdayaan Sumber Daya Manusia

The availability of technology will not have a significant impact without being supported by human resources who are able to utilize it. Therefore, intensive training for village officials is a top priority. This training needs to be designed based on daily tasks, such as population data management, budget reporting, and operation of the Village Information System (SID) application (Hombone, 2025).

Moreover, empowering the younger generation as technology volunteers can have a double impact. On the one hand, village officials receive direct assistance in utilizing technology, while on the other hand, young people feel involved in the development of their village. This approach is in line with the principle of participation in development administration, where the community is actively involved in the decision-making process and program implementation.

In addition to village officials, training must also target the general public, especially local business actors. Introducing technology to them, such as marketing products through digital platforms, can increase local economic competitiveness and support sustainable development.

Collaboration with Third Parties

Collaborative approaches are one of the key strategies to ensure successful technology implementation. Citengah Village can establish partnerships with the private sector, universities, and donor agencies to support digitalization programs. For example, technology companies can provide hardware or software as part of their CSR programs.

In addition, local universities can be involved in designing training programs or assisting villages in designing local applications for public services. This collaboration not only provides financial solutions but also expands the village's network with parties who have expertise in technology.

Community-based funding can also be an innovative option. Villages can utilize crowdfunding platforms to raise funds from the wider community who care about technology-based village development. This approach not only opens up new sources of funds but also strengthens the community's sense of ownership of the programs being run.

These strategies are fully in line with the principles of development administration that emphasize transparency, participation, and accountability. Adequate digital infrastructure allows for transparency in budget management and village performance reporting, while community involvement through training and technology volunteers creates inclusive participation.

In addition, this strategy also reflects the Smart Village concept, where technology is used as a tool to improve governance efficiency, accelerate public services, and empower communities. By implementing this approach, Citengah Village can not only overcome existing obstacles but also realize the vision of more modern and sustainable village development. This emphasizes the importance of implementing data-based strategies and collaboration to ensure that technology has maximum impact on Citengah Village. This strategy is a real step in realizing village transformation towards a Smart Village model that supports inclusive development.

E. CONCLUSION

This study shows that Citengah Village has great potential to utilize technology to support sustainable development. With its topography and potential natural resources, this village has established a strategic plan through the RPJMDes to integrate technology into governance and public services. However, the implementation of technology still faces a number of obstacles, namely:

Limited digital infrastructure, where internet access is only available in certain areas. Low human resource capacity, because village officials do not yet have adequate technological literacy. Limited funding, given the dependence on village funds for various priority programs.

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