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THE IMPLEMENTATION OF THE SMART VILLAGE CONCEPT BASED ON THE INTERNET OF THINGS IN OGAN ILIR IN THE DIGITAL DEVELOPMENT OF VILLAGE ECONOMY TOWARDS SOCIETY 5.0

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ABSTRACT The COVID-19 pandemic accelerated the shift from traditional classroom learning to online education, highlighting the role of technology in societal advancement. In Indonesia, the government has prioritized rural development through the Smart Village concept, integrating the Internet of Things (IoT) to enhance governance, economic activities, and community welfare. A key example is Smart Village Ogan Ilir (SVOI), which connects 1,115 village MSMEs, Village-Owned Enterprises (BUMDes), and local governments, fostering business growth, sustainable development, and resource management. SVOI utilizes IoT to improve service delivery, enhance financial literacy, and promote transparency in financial reporting. By facilitating real-time data collection, SVOI enables better decision-making in agriculture and other sectors, contributing to poverty reduction and increased income opportunities. This model demonstrates the transformative potential of IoT and smart villages in boosting rural economies and improving the quality of life for rural populations.

KEYWORDS: *Smart Village; Internet of Thing; Accounting in rural area; Digital Development; Village Economy.*

1. INTRODUCTION

The covid-19 pandemic has brought a change from learning in class to an online class (Maria et al., 2022). Technology has advanced in every aspect of life, both in urban and rural areas (Mayasari et al., 2023), Technology has undergone development and has become a driving force behind the progress and advancement of a country. Government organizations have a very crucial role for the progress and development of a country (Martini, Karlina, et al., 2022). The development of a country is characterized by the presence of progress and construction. This development can begin at the most fundamental level, namely the village. Building Indonesia from the village is one of the government's priority agendas through strengthening rural areas (Dwitayanti et al., 2020).

The village government plays a role in the development of governance. Regional Governments in Indonesia currently have the role as the organizer of government affairs according

to the principle of autonomy and duty of assistance with the principle of broad autonomy (Mayasari & Febriantoko, 2018). To support the development of a village, it is backed by the concept of a Smart Village based on the Internet of Things, which provides ease in village administration activities and ensures safety for the village community, particularly concerning criminality and natural disaster risks. Economic activities may decline due to political factors, inappropriate policies, and factors beyond control, such as natural disasters (Sanjaya et al., 2021). Smart villages utilize IoT to create interconnected systems that enhance various aspects of rural life, such as agriculture, healthcare, and energy management. According to Akinsiku, the integration of IoT in smart villages can significantly improve the efficiency of resource management and service delivery, thereby transforming rural communities into sustainable and technologically advanced centers (Akinsiku & Ubochi, 2024).

One of the governments implementing the Smart Village concept is the Ogan Ilir Government, known as Smart Village Ogan Ilir (SVOI). Smart Village Ogan Ilir (SVOI) is an integrated data system that connects 1,115 village MSMEs, 5 Village-Owned Enterprises (BUMDes), and 5 village governments across multiple sectors. SVOI has become a pioneer in transforming village MSMEs into start-ups coordinated by BUMDes and the village government. SVOI is a system based on the Internet of Things (IoT). The IoT concept is fundamentally simple, operating based on three main elements: physical objects, connection devices, and data centers (Masnila et al., 2022). his technology is well-developed, with a comprehensive system in place and classified as an industrial product, making it ready for downstream adoption by society.

With the specifications of SVOI, it can operate on both web and Android platforms, in line with Industry 4.0 towards Society 5.0, facilitating user access. SVOI implements Business Intelligence to generate policy recommendations for partner village governments as the regulatory decision-makers. This aligns with the findings of Cvar et al., who highlight that while smart city concepts have been widely adopted, the application of IoT in rural settings is equally crucial for improving the quality of life in these areas (Cvar et al., 2020). The potential for IoT to facilitate real-time data analytics and automate decision-making processes is particularly beneficial for sectors like agriculture, where timely information can enhance productivity and sustainability (Aljuhani et al., 2023).

The various features within SVOI can assist in sustainable development to reduce poverty. It can also serve as a medium for the marketing strategy of flagship products. A company marketing strategy must always evolve due to changes in the business environment that continues to change from by year and now these changes are felt faster than in previous years because of the impact of globalization, especially the development of social media networks (Kurniawan et al., 2021). The

level of welfare in a region can be measured by the poverty rate (Martini et al., 2021). This system also serves as a platform for the community to open business opportunities, which can increase the village's income, as stated by Martini et al., the allocation of village funds and village original income has a partial positive and considerable impact (Martini, Widyastuti, et al., 2022). This is supported by the work of Adamowicz and Zwolińska-Ligaj, who argue that smart villages can serve as a means to achieve sustainable development goals by fostering resilience and adaptability in rural economies (Adamowicz & Zwolinska-Ligaj, 2020).

SVOI targets the communities of the five partner villages scattered across Indonesia to utilize the E-Government facilities integrated into SVOI for managing all necessary correspondence without the need to visit the village office in person, as stated by Martini et al., management of regional wealth, the level of regional financial dependence, regional size, and regional spending effectively and efficiently for the benefit of local governments to better and/or maximize development in order to improve service to the community will have an impact on the high performance of local governments that have been carried out (Martini, Chalifah, et al., 2022). Each region is expected to further improve the service and welfare of the people in the region by way of further exploring the resources owned by the region (Martini et al., 2019). There are many layers of society that have benefited from the existence of SVOI, which in turn has contributed to the enhancement of the resources they possess, including both human and financial resources.

High-quality human resources can influence economic development through an understanding of finance. Financial literacy will help mitigate issues faced by MSMEs (Micro, Small, and Medium Enterprises) and prepare for a prosperous future. Based on everyday life experiences, not everyone possesses adequate financial knowledge (Masnila et al., 2021). The challenge of access to finance is a key issue faced by MSMEs (Micro, Small, and Medium Enterprises) (Masnila et al., 2024). Effective financial management is capable of producing high-quality reports (Riana Mayasari, 2022).

The financial resources available must be managed effectively to ensure transparency in transactions. As we know, financial reports serve to provide information. Government financial statements are useful to provide information for stakeholders that can be used as a consideration for decision making and policy (Martini, Satirah, et al., 2022). Traditional accounting methods often fall short in capturing the complexities of rural economies, which frequently involve diverse income sources and informal financial practices. Therefore, changes within the internal parties are necessary to achieve the objectives. This is in line with what has been stated Martini et al., Implementing internal control is the main activity to ensure the goal of organization is (Martini, Karlina, et al., 2022). The advent of the Internet of Things (IoT) presents a transformative

opportunity to revolutionize these accounting practices by providing real-time data that enhances financial reporting and decision-making. For instance, IoT devices can automate the collection of data related to agricultural outputs, expenses, and market prices, enabling farmers and rural businesses to maintain accurate financial records with minimal effort (Riaz et al., 2022).

Moreover, the use of IoT in accounting can significantly improve access to financial services for rural enterprises. By integrating IoT data with financial management systems, rural businesses can gain valuable insights into cash flow, inventory management, and profitability, which are crucial for securing loans and investments (Sobhi et al., 2022). Thus, the concept of Smart Village, the Internet of Things (IoT), and accounting practices in rural areas present transformative opportunities to enhance rural economies and improve the quality of life for residents. Smart villages leverage digital technology to create a sustainable and efficient living environment, while IoT facilitates real-time data collection and management, which can significantly improve accounting practices and financial transparency within these communities.

2. METHOD

The training program was designed to ensure effectiveness and efficiency in achieving its objectives. The method employed involved a hybrid approach combining online and offline sessions. The detailed methodology is as follows:

Preparation Phase

a. Needs Assessment

An initial survey was conducted among prospective villages to assess the economic level of the village. The results of this survey will be used to design the system that will be implemented.

b. System Development

In preparation for the use of this system, the system development is divided into two components: software system and hardware system.

c. Coordination

Technical preparations were carried out for online sessions (using Zoom) and offline sessions, including the provision of equipment and arrangements for training venues. Research shows that hybrid learning can expand the reach of education, allowing more students to engage in the learning process (Thariq Aziz et al., 2022).

Training Implementation

1. Online Sessions

   The online sessions were conducted to identify issues and provide theoretical understanding. The sessions lasted an average of 1.5 hours. The interactive online delivery method effectively engaged participants and enhanced conceptual understanding.

2. Offline Sessions

   The offline sessions were held in Ogan Ilir. This session focused on hands-on practice in using the system facilitated by the instructors. The face-to-face activities strengthened the understanding of how to use the system.

3. Discussions

   The village authorities participated in discussions to explore the challenges and solutions related to the implementation of the system in their governance. These discussions fostered knowledge sharing and problem-solving.

Evaluation

a. Participant Feedback

   The village authorities were asked to provide feedback to evaluate their training experience. The systematic collection of feedback will refine the training program and effectively address emerging challenges.

b. Data Analysis

   The feedback data was analyzed to generate a training performance report. This approach ensures data-driven decision-making and continuous improvement.

c. Post-Training Mentoring

   The implementation team provides post-training support to address participants' questions and ensure field implementation. Ongoing support is crucial to sustain the training's impact and encourage long-term application.

d. Digital Guide Development

   A PDF guide is provided to participants to facilitate access to training materials, enabling village governments to make adjustments to the system. The government should immediately make system adjustments and make technical guidelines for the use of applications (Ishmaturahwa et al., 2022). This method is designed to ensure active involvement of the villages, enhance understanding of the system, and promote the implementation of sustainable Smart Village concepts.

3. RESULT AND DISCUSSION

3.1 Result

This training program significantly impacts the ease of village administrative activities, facilitates MSMEs in sharing experiences, introducing products, and opening opportunities for collaboration, enables faster and more effective communication between MSMEs to support transactions, and provides a sense of security against natural disasters.

Table 1. Framework for Smart Villages

Phase	Attributes (Generic)	Attributes (Indian Conditions)
PHASE I :Smart Village Core Group Formation	**Society** , **Government** (Local, State, Country), **NGO** (Mentoring, Handholding),	Using the Panchyati Raj System Convergence of Promotion of Startups in Villages, Prominent NGOs, Prominent Interest

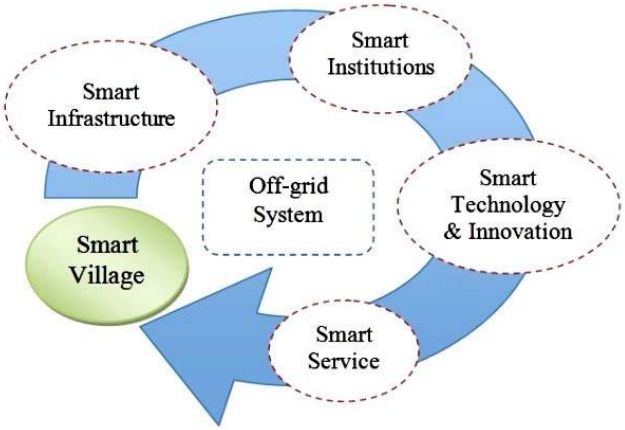

Figure 1. Smart Village Concept

Figure 2. Proses penelitian di Ogan Ilir

This program targets villages in Ogan Ilir and is conducted by faculty members from the Accounting Department of Politeknik Negeri Sriwijaya (Polsri), Palembang, Indonesia. The program involves village governments in Ogan Ilir through both online and offline methods. Its objective is to introduce the concept of a sustainable Smart Village to MSMEs and BUMDes, enabling them to understand the importance of business practices that incorporate technology. Through training methods, village governments are guided to understand how technology impacts the economy and development.

Figure 3. Penyerahan sistem SVOI

This program targets villages in the Ogan Ilir region and is implemented by faculty members from the Accounting Department of Politeknik Negeri Sriwijaya (Polsri), Palembang, Indonesia. The program is designed to actively engage village governments using a hybrid approach, combining both online and offline methods, to ensure the effectiveness of content delivery and more optimal guidance.

The main focus of this program is to introduce and implement the concept of a sustainable Smart Village to Micro, Small, and Medium Enterprises (MSMEs) as well as Village-Owned Enterprises (BUMDes). Through this program, it is hoped that business practitioners in the villages will understand the importance of applying technology in running and developing their businesses. Technology not only serves as a tool to enhance operational efficiency but also opens up broader market opportunities through digitalization and data-driven economic systems.

In addition, through a series of training sessions and technical guidance, village governments are provided with in-depth insights on how technology can play a role in driving economic growth and sustainable development. This program also includes education on the utilization of the Internet of Things (IoT), the digitalization of village finance, as well as innovative strategies to enhance the competitiveness of local MSMEs. Thus, the implementation of the Smart Village concept is

expected to serve as a concrete solution in accelerating the digital transformation of villages, strengthening the local economic ecosystem, and improving the welfare of the community in Ogan Ilir.

3.2. Discussion

Effectiveness of the Hybrid Method

The combination of online and offline sessions demonstrates excellent flexibility for the participants.

Teachers as Agents of Change

The faculty members participating in this training have demonstrated an improvement in their ability to implement the Smart Village concept for the digital economic development of villages. The integration of sustainable human resource development strategies is vital for the successful implementation of technology-driven solutions, such as offline accounting applications, which can significantly improve economic empowerment in rural settings (Muda & Erlina, 2020).

Adopsi oleh Pemerintah Desa

The village governments participating in the training have shown a better understanding of the interconnection between economic, social, and environmental activities. Some village governments have implemented sustainable principles in their daily activities, such as waste management and reducing plastic usage. Community involvement has a significant impact on the success of the program and development (Fadila et al., 2024).

Comparison with Similar Programs

The implementation of the Smart Village concept within village governments has resulted in improvements for both the villages and the researchers, although the outcomes differ between the two groups. The intersection of technology and rural development presents new opportunities for enhancing economic activities. The application of big data and IoT in rural areas can facilitate better service delivery and resource management, ultimately leading to improved living standards (Wang et al., 2022).

These findings highlight how technology positively impacts village economic development by increasing village income, which in turn has a positive influence on the economy. Martini et al. state that changes in income will increase SILPA and PPE, and the higher the PPE, the more it will reduce capital expenditure (Martini et al., 2020).

For researchers, the effects are similarly positive, although they focus on different aspects of their professional roles. Additionally, Liu and Yang's exploration of leadership and governance tools for sustainable development, while focused on China, underscores the importance of effective leadership in fostering successful rural governance networks (Liu & Yang, 2019).

This indicates that the implementation of the Smart Village concept not only supports the villages but also helps researchers cultivate a sense of responsibility.

In short, while both villages and researchers benefit from the implementation of the Smart Village concept, the outcomes vary. Villages show improvements in technology, economy, and development, while researchers develop a sense of responsibility and increased confidence. This underscores the importance of technology for village governments and researchers, promoting systems that facilitate effective governance for village administrations.

Challenges and Solutions

The main challenge includes technological barriers in operating the systems used. Solutions, such as the module on how to use the SVOI system, have successfully addressed this issue. However, infrastructure improvements remain a necessity to support the sustainability of the program.

4. CONCLUSION

The implementation of the Smart Village concept in the Ogan Ilir region has shown promising results in advancing both the technological and economic development of rural areas. Through the active engagement of village governments and local Micro, Small, and Medium Enterprises (MSMEs), the program has successfully introduced and implemented sustainable practices that harness the potential of technology. The hybrid approach, combining online and offline methods, has proven to be effective in ensuring flexibility and optimizing the delivery of content.

While the outcomes have been beneficial for both the villages and the researchers, they differ in nature. Villages have seen tangible improvements in technology adoption, economic empowerment, and the overall development of sustainable practices, while researchers have gained a stronger sense of responsibility and increased confidence in their professional roles. This underscores the broader impact of the program, highlighting how technology can foster sustainable economic growth while also contributing to human resource development.

However, challenges remain, particularly regarding technological barriers and the need for infrastructure improvements to ensure the long-term success of the program. Addressing these issues will be critical in maintaining the momentum of the digital transformation and sustaining the

positive outcomes for both the villages and the researchers. The findings emphasize the importance of continued collaboration and investment in technology to enhance governance, improve economic activities, and ultimately elevate the welfare of rural communities.

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CONFLICT OF INTERESTS

The authors declare that there are no conflicts of interest related to the implementation of this program. All processes, including planning, implementation, and activity reporting, were conducted independently based on participation in the program, without any external influence. The publication costs of this article were covered by personal funds. The content of this article does not represent the views, positions, or perspectives of the program's funding providers, the implementing faculty members, partner institutions, or Politeknik Negeri Sriwijaya.

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