

# The Role of Information Technology in Advancing Education and Economic Development in Karang Agung Ilir

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## Abstrak

Perkembangan teknologi informasi (TI) memainkan peran penting dalam meningkatkan kualitas hidup masyarakat, termasuk mereka yang berada di daerah terpencil seperti Karang Agung Ilir, Kabupaten Musi Banyuasin, Sumatera Selatan. Kondisi geografis daerah ini, yang ditandai dengan rawa-rawa dan sungai, membatasi akses ke pendidikan, ekonomi, dan layanan publik. Implementasi TI di Karang Agung Ilir mulai terlihat melalui penggunaan internet di sekolah-sekolah, pelatihan digital untuk guru, dan penggunaan media sosial untuk mempromosikan usaha kecil dan menengah (UKM). Namun, implementasi TI masih menghadapi berbagai kendala, seperti akses internet yang terbatas, literasi digital yang rendah, dan kurangnya fasilitas teknologi. Upaya pemerintah melalui program pengembangan jaringan internet pedesaan dan pelatihan literasi digital adalah langkah penting untuk memperluas pemanfaatan TI di daerah ini. Dengan mengoptimalkan penggunaan teknologi informasi, diharapkan Karang Agung Ilir dapat berkembang menjadi daerah yang lebih maju, mandiri, dan terhubung secara digital.

**Kata kunci:** Teknologi Informasi, Karang Agung Ilir, pendidikan, literasi digital, daerah terpencil

## Abstract

The development of information technology (IT) plays a crucial role in improving the quality of life for communities, including those in remote areas such as Karang Agung Ilir, Musi Banyuasin Regency, South Sumatra. This region's geographical conditions, characterized by swamps and rivers, limit access to education, the economy, and public services. The implementation of IT in Karang Agung Ilir is beginning to be seen through internet use in schools, digital training for teachers, and the use of social media to promote small and medium enterprises (MSMEs). However, IT implementation still faces various obstacles, such as limited internet access, low digital literacy, and a lack of technological facilities. Government efforts through rural internet network development programs and digital literacy training are important steps to expand IT utilization in this region. By optimizing the use of information technology, it is hoped that Karang Agung Ilir can develop into a more advanced, independent, and digitally connected region.

**Keywords:** Information Technology, Karang Agung Ilir, education, digital literacy, remote areas

## 1. INTRODUCTION

Information technology (IT) has become a key driver of progress in various sectors of community life. This applies not only to large cities but also to remote areas such as Karang Agung Ilir, located in Musi Banyuasin Regency, South Sumatra. IT and digital infrastructure create opportunities for more inclusive access to services, education, economic activities, and public participation in development processes (Haraha et al., 2025). Karang Agung Ilir has highly challenging geographical conditions, with much of its territory consisting of swamps

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and rivers. This condition hinders public access to various public services such as education, health care, and more advanced economic development. The limited tech infrastructure in rural contexts correlates with broader issues identified in frontier and disadvantaged areas, where digital equity remains uneven and significant barriers persist for students, teachers, and community members (Susanti & Nurhayati, 2024). This limited access impacts the quality of life of local residents, who struggle to obtain information and technology that could improve their standard of living. Studies show that rural communities that experience digital divide encounter setbacks in education, health information, and socioeconomic engagement, often leading to persistent gaps in community development outcomes (Digital divide in rural communities, 2025).

According to Sembiring (2010), areas with limited access to information technology tend to lag behind in various aspects, from education to the economy. Recent empirical evidence confirms that limited digital infrastructure and literacy exacerbate inequalities between rural and urban regions, impacting students' access to knowledge and local enterprise competitiveness (Amalia et al., 2025). Therefore, the introduction and utilization of information technology in areas such as Karang Agung Ilir is crucial, both to facilitate better access to education and to open up new economic opportunities. Digital technology integration has been shown to support more effective learning, e-commerce participation, and community resilience when paired with targeted literacy programs and infrastructure investments (Rujitoningtyas et al., 2024).

The role of technology in introducing new learning methods, providing access to digital resources, and expanding markets for micro, small, and medium enterprises (MSMEs) is key to regional development. Digital platforms help MSMEs reach broader customer bases through social media, online marketplaces, and digital payment systems provided that infrastructure and capacity building are present (Web search literature on ICT in SMEs, 2024). In the education sector, for example, technology can be used to connect schools to various educational resources that were previously difficult to access. This enables more interactive and up-to-date teaching and makes information easier for teachers and students to access. Innovations such as village digital learning hubs and digital literacy integration have shown promise in expanding educational reach in remote regions with constrained connectivity (Muslimin & Indrawati, 2024).

Furthermore, local governments are recognizing the importance of utilizing social media and other digital platforms to promote small and medium enterprises (MSMEs). MSMEs in Karang Agung Ilir can leverage the internet to reach a wider market, both locally and globally. Empirical research from rural digital villages highlights how digital communication and online marketing skills enhance local enterprises' competitiveness and market integration (Nugroho et al., 2025). This undoubtedly opens up significant opportunities for the local economy. Rural MSMEs that adopt digital technologies show improvements in visibility and profitability when supported by structured training in digital tools (Riyanto et al., 2024).

However, as noted in the literature, the main challenges in implementing information technology in remote areas are limited infrastructure that supports fast and equitable internet access, low digital literacy, and a lack of technology facilities in schools and MSMEs (Amalia et al., 2025). Limited broadband and mobile internet services in rural contexts are associated with higher adoption barriers for both students and business owners, slowing down education digitalization and economic digitization (Equitas FEB UGM, 2024).

Low digital literacy remains a significant constraint, especially when community members lack confidence and training to use digital tools for learning, business, or administrative purposes. Raising digital literacy emerges as an essential strategy for empowering rural communities to overcome the digital divide and engage meaningfully in contemporary socio-economic activities (Santosa et al., 2024). These challenges slow the digitalization process and require serious attention from the government and private sector to increase regional technological capacity. Multisector collaborations (government + private sectors + educational institutions) have been shown to accelerate digital readiness and capacity building in rural enterprises (Susanti et al., 2025).

The local government's rural internet network development program and digital literacy training are important initial steps in paving the way for wider use of information technology. Enhancing teacher digital skills, infrastructure expansion, and community training support broader digital inclusion (Susanti & Nurhayati, 2024). However, to achieve optimal results, these efforts must be balanced with more inclusive education and increased human capacity to use technology effectively. Equitable digital inclusion in education and economy requires policy attention to schooling resources and rural ICT systems (Muslimin & Indrawati, 2024).

Thus, Karang Agung Ilir has great potential to develop into a more advanced, independent, and digitally connected region, provided that infrastructure and digital literacy continue to be improved. Research indicates that targeted investments in digital tools and connectivity directly correlate with increased community resilience, better educational outcomes, and enhanced economic engagement for rural populations (Amalia et al., 2025). Policy frameworks that promote “smart village” concepts and coordinated rural development with digital literacy can further empower communities, driving sustainable growth (SMART-UMKM program, 2025). In summary, the integration of information technology in remote settings like Karang Agung Ilir expands educational access, supports MSME market participation, and fosters community empowerment provided supportive infrastructure, inclusive policies, and comprehensive capacity building are sustained.

## **2. METHOD**

This research uses a descriptive qualitative approach with a survey and field-based research design to obtain a comprehensive overview of the implementation of information technology in Karang Agung Ilir. Qualitative descriptive research is appropriate to provide rich, contextual insights into social phenomena based on observation and narrative data rather than numeric measures (Furidha, 2023).

The approach was chosen to gather in depth information about how information technology is implemented in the education and local economic sectors, and the challenges faced by the community and relevant stakeholders. Qualitative approaches such as descriptive design offer flexibility in capturing lived experiences, perspectives, and contextual conditions that cannot be easily quantified (Lim, 2025).

### ***2.1 Research Location***

This research was conducted in Karang Agung Ilir, a geographically isolated village in Musi Banyuasin Regency, South Sumatra. The challenging landscape presents major barriers for technology introduction and use. Descriptive qualitative studies in rural and isolated communities often require purposeful sampling and field engagement to ensure contextual relevance and depth of understanding (Nurhayati et al., 2024).

## ***2.2 Data Collection Techniques***

Data collection was conducted through direct observation and in-depth interviews. Combining multiple data collection methods is common in qualitative research to ensure comprehensive coverage of the phenomena studied.

Direct Observation, Observations were conducted at schools and MSMEs to examine information technology infrastructure and its usage. Observational techniques allow researchers to observe real-world behaviors and patterns, especially in complex socio-cultural environments. In-depth Interviews, in-depth interviews were conducted with teachers, MSME actors, and local government officials. Interviewing is widely used in qualitative research to elicit detailed perspectives and experiences from participants (Xu, 2025).

## ***2.3 Secondary Data Collection***

Secondary data was collected through literature review, government reports, and internet usage statistics to contextualize primary findings. Including secondary sources is essential to deepen understanding and enrich empirical observations in descriptive studies.

## ***2.4 Data Analysis Techniques***

Data from observations, interviews, and secondary materials were analyzed using thematic analysis, which is suitable for identifying themes and patterns in qualitative data. Thematic analysis enables researchers to interpret meaning across large amounts of narrative data (Thematic analysis, 2026). Thematic analysis is increasingly recognized as a rigorous and flexible method for coding and interpreting qualitative data in applied social research contexts (Christou, 2026).

## ***2.5 Validity and Reliability***

To ensure validity and reliability, this study uses triangulation, comparing data from observations, interviews, and secondary sources. Triangulation enhances credibility by verifying findings across multiple data sources and methods.

## ***2.6 Sampling Locations***

Sampling points include:

- a. Schools with varied IT infrastructure;
- b. MSMEs with and without digital platforms;
- c. Local government units responsible for tech policy and training enabling an inclusive perspective across stakeholders.

## ***2.7 Research Time***

This study spans three months (January–March 2025), ensuring sufficient time for iterative data collection and emergent analysis consistent with qualitative research timelines (Lim, 2025).

# **3. RESULT AND DISCUSSION**

After conducting data collection and analysis, this study uncovered several key findings related to the implementation of information technology in Karang Agung Ilir in both the education and economic sectors. These findings are discussed based on data obtained from

observation, interviews, and secondary sources. Similar studies indicate that rural and remote areas experience uneven technology adoption due to infrastructure and human resource limitations (Susanti & Nurhayati, 2023; Amalia et al., 2024).

The implementation of information technology in the education sector in Karang Agung Ilir has shown varying results. Observations revealed that several schools have begun integrating information technology into teaching and learning activities and that teachers have received basic training in technology usage. This aligns with previous findings that initial digital integration in rural schools often begins with basic tools and limited pedagogical application (Muslimin & Indrawati, 2024). However, despite the availability of technological facilities, classroom utilization remains limited. Many teachers struggle to optimize internet and digital devices due to insufficient advanced training and time constraints within the curriculum. Research indicates that teacher competency and workload are significant barriers to effective digital learning implementation in rural contexts (Santosa et al., 2024; Nugroho et al., 2025).

Another obstacle is unstable internet access, particularly in more remote areas. Several schools reported frequent connection disruptions, which hinder online learning activities. Similar challenges have been documented in studies of rural education where poor connectivity reduces the effectiveness of digital instruction (Susanti & Nurhayati, 2023; Amalia et al., 2024).

Furthermore, although digital training has been provided, digital literacy among teachers and students remains low. Most participants only mastered basic technological skills such as searching for information or using word-processing applications. This finding supports research indicating that digital literacy development requires continuous and structured training rather than one-time workshops (Riyanto et al., 2024; Muslimin & Indrawati, 2024).

The principal of SMP Karang Agung Ilir emphasized the need for advanced training in digital learning applications to support student learning. This reflects broader conclusions that teacher professional development is essential for sustainable technology integration in education (Santosa et al., 2024).

**Application of Technology in the Economic Sector (MSMEs),** In the economic sector, particularly MSMEs, information technology has begun to play a positive role, especially through the use of social media platforms such as Facebook, Instagram, and WhatsApp for product promotion. This finding corresponds with previous studies showing that social media adoption expands market reach for rural MSMEs (Nugroho et al., 2025; Rujitoningtyas et al., 2024). However, technology use remains limited to basic promotional activities. Many MSME actors reported difficulty utilizing more advanced digital marketing strategies and e-commerce platforms. Research suggests that limited digital skills and lack of knowledge about online business management hinder MSME digital transformation (Amalia et al., 2024; Riyanto et al., 2024).

Furthermore, unstable and slow internet access reduces the effectiveness of online promotion and negatively impacts MSME income. Similar findings were reported by Susanti et al. (2025), who found that infrastructure inequality remains the main barrier to rural digital entrepreneurship.

Despite these challenges, several success stories were identified. One handicraft MSME that actively used Instagram succeeded in reaching wider markets and increasing revenue. This supports evidence that targeted digital adoption can significantly improve MSME competitiveness and economic resilience (Nugroho et al., 2025; Rujitoningtyas et al., 2024).

Local Government Efforts to Support Information Technology, The Musi Banyuasin Regency government, through the Communication and Informatics Office (Diskominfo), has implemented programs such as rural internet network development and digital literacy training. These initiatives align with national and regional digital inclusion strategies that emphasize infrastructure expansion and human resource development (Susanti et al., 2025; Santosa et al., 2024).

Digital literacy training has increased community confidence in using technology for educational and economic purposes. However, stakeholders emphasized the need for advanced training to ensure optimal technology utilization. Studies confirm that continuous capacity building is more effective than short-term training in fostering sustainable digital transformation (Muslimin & Indrawati, 2024; Riyanto et al., 2024). Despite these efforts, disparities in internet access remain between villages. Infrastructure inequality continues to limit the benefits of digitalization in rural areas (Amalia et al., 2024; Susanti & Nurhayati, 2023).

#### Challenges and Barriers to the Implementation of Information Technology

Based on research findings, the main challenges in Karang Agung Ilir include: Limited Internet Infrastructure – Unstable and slow internet access restricts technology utilization in education and MSMEs. Similar barriers have been reported in rural development studies (Susanti et al., 2025; Amalia et al., 2024). Low Digital Literacy – Many teachers and MSME actors lack sufficient digital skills, reducing the effectiveness of technology use. Digital literacy is widely recognized as a core requirement for successful digital inclusion (Santosa et al., 2024; Nugroho et al., 2025). Lack of Technological Facilities – Limited access to computers and digital devices hampers learning and business development. Research confirms that equipment availability is a key determinant of digital adoption in rural institutions (Muslimin & Indrawati, 2024; Rujitoningtyas et al., 2024).

## **4. CONCLUSION**

Based on the findings of the study in Karang Agung Ilir, it can be concluded that the application of information technology has had a positive impact on both the education and economic sectors. In education, the presence of technology facilities has been beneficial; however, its utilization in learning remains limited due to challenges such as unstable internet access, low digital literacy among teachers and students, and insufficient technological infrastructure. In the economic sector, particularly among MSMEs, technology especially social media has contributed to product marketing and market expansion, yet limited internet access and insufficient knowledge of digital tools continue to hinder optimal performance.

The main challenges identified include inadequate infrastructure, low digital literacy, and limited technological facilities, which constrain the full potential of digital transformation in the region. While government initiatives such as rural internet development and digital literacy training have had a positive effect, more sustained and comprehensive efforts are required. Strengthening infrastructure, providing continuous digital skills training, and improving technological facilities for schools and MSMEs are essential steps to ensure

equitable access and maximize the benefits of technology. Overall, with integrated strategies that combine infrastructure development and human resource empowerment, Karang Agung Ilir has strong potential to become a more advanced, independent, and digitally connected community.

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