

Implementation of Information and Communication Technology (ICT) in Driving the Growth of Village MSMEs

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Abstract. This research investigates how Information and Communication Technology (ICT) affects the growth of Micro, Small, and Medium Enterprises (MSMEs) in villages. Using ICT has become essential and unavoidable. This research uses descriptive data analysis techniques to provide an overview of how MSMEs adapt and examine how digital technology is used by MSMEs. The research results show that the implementation of ICT in village MSMEs has had a significant impact in several aspects, including increasing market access, operational efficiency, and empowering local communities. The use of e-commerce platforms, mobile apps, and inventory management systems is crucial for the growth of MSMEs in villages. However, challenges like limited infrastructure, low digital literacy, and data security issues hinder ICT implementation. This research emphasizes the need for supportive policies, skills training, and cross-sector collaboration to strengthen the ICT ecosystem for village MSMEs. These insights help stakeholders, local governments, and economic development organizations create better strategies to support rural MSMEs through ICT.

Keywords: Information and Communication Technology (ICT), Digitalization, MSMEs, Villages

1 Introduction

According to Law No. 20 of 2008 concerning Micro, Small, and Medium Enterprises, MSMEs are businesses run by individuals, households, or small-scale business entities. In tight competition with many competitors, MSME players must use effective marketing and media strategies to attract the target market and increase revenue. Micro, Small, and Medium Enterprises (MSMEs) contribute greatly to the total gross domestic product (GDP) in Indonesia at 60.5%. MSMEs can create significant employment opportunities, empower the local economy, and act as an effort to eradicate poverty. According to information from the Ministry of Cooperatives and Small and Medium Enterprises (Kemenkop UKM), the MSME sector contributes around 61% to Indonesia's Gross Domestic Product (GDP), equivalent to a value of around IDR 9,580 trillion. The data also shows that Indonesia has around 65.5 million MSMEs, which account for around 99% of the total business units in the country.

The growth of Micro, Small, and Medium Enterprises (MSMEs) in Indonesia is expected to continue to increase and become one of the main factors in driving economic growth in this

country.[1] Therefore, MSMEs need to be managed adequately so that they can continue to grow sustainably. One way is to adopt Information and Communication Technology (ICT) in carrying out MSME business operational activities in the village. In this increasingly digitally connected era, the use of ICT by MSMEs is becoming increasingly important in increasing their competitiveness and expanding their market reach. However, implementing ICT in village environments often faces unique challenges, including limited technological infrastructure and low levels of digital literacy in some areas. To remain competitive in the global market, MSMEs need to have a good understanding of information technology (IT) to facilitate product marketing internationally.

The rapid development of the internet has resulted in innovation, especially in financial technology, which aims to meet people's needs in terms of access to financial services and transaction processing.[2] The penetration of Internet use is the basis for the development of current economic trends. The growth of the internet has opened up connectivity for micro, small, and medium businesses which have an important role in the economy. Technological advances provide wider market opportunities for MSMEs.

This research aims to investigate how ICT implementation influences the growth of MSMEs in villages, as well as its impact on various aspects, such as market access, operational efficiency, and empowerment of local communities. By using descriptive data analysis techniques, this research will provide a comprehensive picture of how MSMEs adapt to digital technology and the extent of its use.

It is hoped that the results of this research will provide valuable insights for various parties, including local stakeholders, regional governments, and economic development organizations, in designing supportive policies and more effective strategies for strengthening the ICT ecosystem to support the growth of MSMEs in villages. In addition, the findings of this research can also serve as a basis for identifying areas where technical assistance and skills training are needed to increase the adaptation and adoption of ICT by MSMEs in rural settings. The research process begins with the identification and selection of literature that is relevant to the research topic, using appropriate keywords such as "ICT implementation", "MSME growth", and "village". After that, an in-depth analysis of the content of the selected literature was carried out, taking into account important findings, methodological approaches, and conceptual frameworks used by previous researchers.

2 Methods

This research uses a qualitative approach focuses on a literature study to explore and analyze the implementation of Information and Communication Technology (ICT) in supporting the growth of Micro, Small and Medium Enterprises (MSMEs) in the village environment. The main data source on which this research is based is a comprehensive literature study, including theories and research results contained in previously existing scientific literature, articles, and other related publications[3] The literature study method is used to collect data from various texts and literature sources related to the research topic, including academic journals, books, research reports, and policy documents.

Qualitative analysis was carried out to identify patterns, trends, and main findings that emerged from the literature that had been reviewed. This qualitative research method allows researchers to gain an in-depth understanding of issues related to ICT implementation in village

MSMEs, as well as gain insight into the factors that influence the success or failure of various approaches and strategies that have been implemented in different contexts.

Next, conclusions are drawn inductively based on the findings found in the literature. This process involves synthesizing data from various sources and developing a deeper understanding of the implications of ICT implementation in supporting the growth of MSMEs in villages. These inductive conclusions allow researchers to present a more comprehensive picture of the potential and challenges associated with the use of ICT in the context of rural MSMEs, as well as identify directions for further research and future policy development.

3 Discussion and Result

3.1 Information and Communication Technology (ICT) Trends in Village MSMEs

Information and Communication Technology (ICT) trends in Micro, Small, and Medium Enterprises (MSMEs) in villages are a reflection of the digital evolution that is taking place in various economic sectors. Basry and Sari's research stated that ICT effectively has a direct influence on MSMEs in increasing productivity and efficiency.[4] Here is a more detailed and comprehensive look at the trend:

3.1.1 E-commerce Platform Adoption

E-commerce is the process of buying and selling goods or services carried out online via the Internet.[5] One of the most prominent trends is the adoption of e-commerce platforms by rural MSMEs. This platform provides MSMEs with the opportunity to sell their products online, reaching a wider market, both regionally and globally. On this platform, MSMEs can promote their products more effectively, manage orders, and expand their customer base. In addition, e-commerce platforms also facilitate safe and efficient transactions, helping rural MSMEs to compete in an increasingly digitally connected market. Overall E-commerce adoption is influenced by factors such as environment, organization, technology, and perception of its benefits.[6]

3.1.2 The Use of Mobile Applications

Mobile applications are an important tool in supporting the daily operations of village MSMEs. The implementation of an Android-based mobile marketing application for MSME products allows ordering goods online, which can speed up the transaction process between sellers and consumers.[7] With mobile applications, entrepreneurs can manage inventory, track sales, interact with customers via instant messaging, and manage their finances more efficiently. The existence of mobile applications also allows MSMEs to stay connected with their business wherever they are, providing greater flexibility in running their operations.

3.1.3 Digitalization of Business Processes

Rural MSMEs are increasingly utilizing technology to digitize their business processes. This includes digitizing marketing through social media and online advertising, using accounting software to manage finances, and implementing a customer relationship management (CRM) system to strengthen relationships with customers. Digital marketing systems help MSMEs reach more people through

websites and social media.[8] This digitalization helps MSMEs to increase operational efficiency, improve service quality, and provide a better experience to customers.

3.1.4 Increasing Digital Literacy

Increasing digital literacy among entrepreneurs and rural communities is a significant trend. Digital skills training programs are increasingly available, both from governments, non-governmental organizations and private companies. This training covers a variety of skills, from basic computer and internet use to utilizing business applications and digital marketing strategies. This increase in digital literacy helps village MSMEs to be more effective in adopting technology and utilizing it for their business growth.

3.1.5 Collaboration and Networking

Rural MSMEs increasingly recognize the importance of collaboration and networks in facing challenges and exploiting opportunities. They are involved in various strategic partnerships with other MSMEs, large companies, educational institutions, and local governments for the exchange of knowledge, resources, and wider market access. This collaboration not only strengthens the position of rural MSMEs in the market, but also allows them to utilize technology and innovation more effectively.

3.2 Impact of Implementing Information and Communication Technology (ICT) in Village MSMEs

3.2.1 Increasing Market Access

The implementation of Information and Communication Technology (ICT) in village MSMEs has succeeded in increasing market access for local entrepreneurs. Through e-commerce platforms, village MSMEs can reach customers in various regions online, which were previously difficult to access through conventional distribution channels. This opens up new opportunities for village MSMEs to expand their market reach and increase their income.

The adoption of e-commerce platforms is one of the prime examples of how ICT has changed the traditional business paradigm. E-commerce platforms enable rural MSMEs to overcome geographic barriers and target markets far outside their local environment. With online access, MSME products can be accessed by consumers in various regions, both regionally and globally. This allows rural MSMEs to reach a wider audience than they could reach through traditional distribution channels. With an e-commerce platform, village MSMEs are no longer limited by physical reach or limited infrastructure. They can market their products to big cities, even abroad, without having to have a physical store in that location. This opens up new opportunities for village MSMEs to gain a larger market share and increase their income.

In the context of traditional distribution channels, distribution costs such as transportation and storage can be a large burden for rural MSMEs. However, with e-commerce platforms, distribution costs can be reduced significantly because products can be shipped directly from manufacturers to consumers, eliminating the need for long distribution chains. With an online presence, rural MSMEs can increase their visibility and brand awareness. Through e-commerce platforms, they can promote their products

more effectively, using digital marketing strategies such as online advertising and social media to reach a wider range of potential consumers.

Thus, through the implementation of ICT, especially through the adoption of e-commerce platforms, village MSMEs have succeeded in opening wider market access, expanding their market reach, reducing distribution costs, and increasing their brand visibility, which in turn has contributed to increasing income and their overall business growth.

3.2.2 Operational Efficiency

The use of mobile applications and inventory management systems has helped rural MSMEs improve their operational efficiency. Mobile applications enable entrepreneurs to manage orders, payments, and communication with customers more efficiently, while inventory management systems help optimize inventory and reduce the risk of stock loss. This leads to increased productivity and profitability of village MSMEs. Apart from that, the implementation of an inventory management system has helped village MSMEs optimize their inventory of goods. With this system, entrepreneurs can track in real-time their inventory levels, forecast customer demand, and manage purchasing and procurement more efficiently. This helps in avoiding excess inventory or understocking, which ultimately reduces the risk of losses and improves overall operational efficiency.

Operational efficiencies resulting from the use of mobile applications and inventory management systems directly contribute to increasing the productivity of village MSMEs. With more efficient operational processes, entrepreneurs can focus on their core business activities without being distracted by time-consuming administrative tasks. This allows them to produce more products or services in less time, which in turn increases output and profitability. Overall, operational efficiencies achieved through the use of mobile applications and inventory management systems contribute to increasing the profitability of rural MSMEs. By reducing operational costs and increasing productivity, MSMEs can increase their profit margins. This gives them a competitive edge in an increasingly tight market and allows them to survive and thrive in the long term.

Thus, the use of mobile applications and inventory management systems has helped rural MSMEs in improving their operational efficiency, increasing productivity, and ultimately, increasing the profitability of their businesses.

3.2.3 Local Community Empowerment

Empowering local communities through the implementation of Information and Communication Technology (ICT) in villages has had a significant positive impact, covering several important aspects:

1. Creation of local jobs

The adoption of digital technology by village MSMEs has opened up new opportunities to create local jobs. With the increasing demand for ICT-related skills, MSMEs can recruit locals to manage their technology infrastructure, develop applications or provide training services. This not only provides additional income for village communities, but also reduces the unemployment rate and improves the community's economic welfare.

2. Increase household income

The application of ICT in village MSME operations also contributes to increasing household income at the local level. With wider market access through e-commerce platforms and the use of mobile applications, MSMEs can increase sales of their products. This additional income not only increases the purchasing power of rural communities, but also improves the overall quality of life.

3. Strengthen the local economy

By increasing the productivity and income of village MSMEs, empowering local communities also has an impact on strengthening the local economy as a whole. MSMEs are the main motor of economic growth in villages, generating income that can be used for investment in local infrastructure, education and health services. This helps improve the standard of living and quality of life of society in general.

4. Increased capacity and independence

ICT-related skills training is also an important part of empowering local communities. By acquiring new skills in the use of technology, village communities become more independent in managing their own businesses and facing existing economic challenges. This not only increases their adaptability to change, but also empowers them to become agents of change in their own communities.

3.3 Challenges in Implementing Information and Communication Technology (ICT) in Village MSMEs

Challenges in implementing Information and Communication Technology (ICT) in Micro, Small, and Medium Enterprises (MSMEs) in villages involve various aspects that influence the success and effectiveness of using this technology. The following is a more detailed and comprehensive explanation of these challenges:

3.3.1 Technological Infrastructure Limitations

The main problem faced by village MSMEs is limited, slow, or unstable internet access. This makes it difficult for them to adopt ICT solutions that require a reliable internet connection, such as e-commerce platforms or cloud-based applications. These limitations also limit MSMEs' ability to communicate with their customers online or access other digital resources necessary to manage their businesses. Apart from limited internet access, village MSMEs also face problems related to physical infrastructure such as inadequate electricity or telecommunications networks. Many villages may not yet have stable electricity infrastructure, causing power interruptions or outages that can disrupt business operations. In addition, poor telecommunications networks can also make it difficult to access reliable internet or mobile communications. Some villages may not even have adequate electricity or telephone signal. This makes using technological devices such as computers or smartphones difficult or even impossible. These limitations limit the ability of MSMEs to adopt any ICT solutions and often leave them isolated from available digital economic opportunities.

To overcome these limitations in technological infrastructure, concrete steps are needed such as investment in better internet and electricity infrastructure in rural areas. The government and other stakeholders also need to work together to improve internet access and mobile communications in remote villages. In addition, creative solutions

such as wireless network technology or alternative energy sources can also be aligned to overcome this challenge. In this way, rural MSMEs can have better access to digital technology and benefit from the growing digital economy.

3.3.2 Low Level of Digital Literacy

Low digital literacy and financial literacy have a significant influence on the performance of MSMEs [9]. Many entrepreneurs and people in villages may not have an adequate understanding of digital technology and its benefits for business. They may not be familiar with the use of computers or mobile applications, and lack knowledge about how to utilize ICT to increase the efficiency and competitiveness of their business. Many MSME owners do not realize the importance of using an accounting information system for the quality of MSME financial data [10].

Low levels of digital literacy are often accompanied by a lack of awareness of the benefits of information and communication technology (ICT) for their businesses. Rural entrepreneurs may not fully understand the potential of ICT in improving operational efficiency, optimizing marketing, or expanding market reach. In addition, the low level of education in some village areas is an additional factor limiting digital literacy. Lack of access to formal education can hinder the ability of entrepreneurs and rural communities to understand and adopt new technologies quickly and effectively.

Limited infrastructure and human resources in villages can also make training and education about ICT more difficult to deliver and understand by village communities. Lack of educational facilities, limited training, and limited access to skilled instructors can be obstacles to increasing digital literacy at the local level. To overcome the low level of digital literacy among village MSMEs, collaborative efforts are needed between the government, educational institutions and the private sector. Digital skills training programs tailored to local needs can help increase understanding and acceptance of digital technologies. In addition, outreach campaigns and digital literacy programs that are integrated with local economic activities can be an important step to increase awareness of the benefits of ICT for MSMEs in villages. In this way, MSMEs can become better able to take advantage of digital technology to improve their business performance and competitiveness.

3.3.3 Limited Human Resources

Many rural MSMEs do not have personnel with sufficient technical skills to manage their ICT infrastructure. They may not be trained in managing websites, developing custom applications, or dealing with technical issues that may arise. This lack of skills can hinder MSMEs from utilizing technology effectively to support their business operations. While rural MSMEs may be able to employ technology experts, the costs of maintaining and managing their ICT infrastructure may be too high for small businesses. The wages required to be paid to IT specialists can be an additional burden that is difficult to bear, especially if the results of investments in technology are not immediately visible.

Rural MSMEs often have limited time and resources to manage their ICT infrastructure effectively. Entrepreneurs may have to spend a lot of time and effort on the day-to-day running of their business, leaving little time to learn or manage technology. This can result in suboptimal use of technology or a lack of innovation in the use of ICT.

Limited human resources can also hinder village MSMEs from achieving the economies of scale needed to manage ICT infrastructure efficiently. They may not have enough business volume to justify the expense of hiring or retaining full-time IT personnel. As a result, they may face difficulties in gaining access to the resources and technical support they need.

3.3.4 Difficulty in Accessing Finance

Rural MSMEs often face difficulties in accessing funding sources for initial investment in ICT. Financial institutions may be reluctant to provide loans to MSMEs with perceived high risks, or complicated loan application processes may hinder their access. Costs for upgrading hardware and software, as well as internet subscription fees and other ICT services, can also be an additional financial burden for rural MSMEs.

The complex and time-consuming loan application process is also an obstacle for village MSMEs. The necessary documentation and administrative requirements are often difficult to fulfill for MSMEs who have limited resources and knowledge of formal financial procedures. This makes many village MSMEs give up before trying to apply for a loan. Apart from that, a lack of understanding about financial management and how to manage loans can also be an obstacle. Many rural MSME entrepreneurs may not have sufficient knowledge about how to manage their finances effectively, including how to estimate returns on investments in ICT and how to manage debt wisely.

3.3.5 Data Security Issues

Rural MSMEs may be concerned about the privacy of their data and the security risks associated with the use of digital technology. They may not have enough knowledge or resources to protect their data from threats such as hacking or malware attacks. To overcome these challenges, collaborative efforts are needed from various parties, including the government, educational institutions, the private sector, and civil society organizations. Investments in technological infrastructure, digital skills training, easier access to finance, and supportive policies are some of the steps that can be taken to create a conducive environment for successful ICT implementation at the village MSME level.

4 Conclusion

This research illustrates the importance of implementing Information and Communication Technology (ICT) in supporting the growth of Micro, Small, and Medium Enterprises (MSMEs) in the village environment. Based on Law No. 20 of 2008, MSMEs are a significant economic pillar in Indonesia, contributing around 61% to the Gross Domestic Product (GDP) and creating important jobs for the local economy. However, MSMEs are faced with various challenges, including limited market access, low operational efficiency, and low digital literacy in some regions.

The application of ICT, such as the adoption of e-commerce platforms, the use of mobile applications, and the digitization of business processes, has opened up new opportunities for rural MSMEs to expand their market reach, increase operational efficiency, and strengthen local economic empowerment. However, challenges such as limited technological infrastructure, low

digital literacy, limited human resources, difficulties in accessing finance, and data security issues are still the main obstacles that need to be overcome.

To overcome this challenge, cooperation is needed between the government, educational institutions, the private sector, and civil society organizations in providing adequate technological infrastructure, digital skills training, easier access to finance, and supportive policies for village MSMEs. With these steps, it is hoped that village MSMEs can take maximum benefit from the use of ICT to support their economic growth and improve the welfare of village communities as a whole.

References

- [1] D. Krisnawati, "PERAN PERKEMBANGAN TEKNOLOGI DIGITAL PADA STRATEGI PEMASARAN DAN JALUR DISTRIBUSI UMKM DI INDONESIA," *Jurnal Manajemen Bisnis Krisnadwipayana*, vol. 6, no. 1, Feb. 2018, doi: 10.35137/jmbk.v6i1.175.
- [2] T. I. F. Rahma, "PERSEPSI MASYARAKAT KOTA MEDAN TERHADAP PENGGUNAAN FINANCIAL TECHNOLOGY (FINTECH)," *At-Tawassuh*, vol. 3, no. 1, pp. 642–661, 2018.
- [3] M. N. Adlini, A. H. Dinda, S. Yulinda, O. Chotimah, and S. J. Merliyana, "Metode Penelitian Kualitatif Studi Pustaka," *Edumaspul: Jurnal Pendidikan*, vol. 6, no. 1, pp. 974–980, Mar. 2022, doi: 10.33487/edumaspul.v6i1.3394.
- [4] A. Basry and E. M. Sari, "PENGGUNAAN TEKNOLOGI INFORMASI DAN KOMUNIKASI (TIK) PADA USAHA MIKRO, KECIL DAN MENENGAH (UMKM)," *Jurnal IKRA-ITH Informatika*, vol. 2, no. 3, pp. 53–60, Nov. 2018.
- [5] K. Cao and Z. Yang, "A study of e-commerce adoption by tourism websites in China," *Journal of Destination Marketing & Management*, vol. 5, no. 3, pp. 283–289, Sep. 2016, doi: 10.1016/j.jdmm.2016.01.005.
- [6] A. Nurrohmah and F. Alfanur, "ADOPSI E-COMMERCE PADA USAHA MIKRO DAN KECIL DI BANDUNG (STUDI KASUS SUBSEKTOR FESYEN) ADOPTION OF E-COMMERCE ON MICRO AND SMALL ENTERPRISE IN BANDUNG (FASHION SUBSECTOR CASE STUDY)," *e-Proceeding of Management*, vol. 3, no. 2, pp. 1120–1127, Aug. 2016.
- [7] S. Handayani and N. Ario Seno, "Aplikasi Mobile Pemasaran Hasil UMKM Berbasis Android Pada Desa Sumber Agung Bengkulu Utara," *JSAI: Journal Scientific and Applied Informatics*, vol. 6, no. 1, 2023, doi: 10.36085.
- [8] H. Wijoyo *et al.*, *DIGITALISASI UMKM*. Solok: Insan Cendekia Mandiri, 2020.
- [9] B. Bidasari, S. Sahrir, G. Goso, and R. S. Hamid, "Peran Literasi Keuangan dan Literasi Digital dalam Meningkatkan Kinerja UMKM," *Owner*, vol. 7, no. 2, pp. 1635–1645, Apr. 2023, doi: 10.33395/owner.v7i2.1404.
- [10] V. Ari Palma Akadiati, I. Sinaga, L. Sumiyati, and S. Tinggi Ilmu Ekonomi Gentiara, "Dampak Implementasi Sistem Informasi Akuntansi atas Kualitas Data Keuangan UMKM Saat Pandemi," *Jurnal Akuntansi*, vol. 32, no. 10, pp. 3069–3080, 2022, doi: 10.24843/EJA.2022.v.