

# Production efficiency and product innovation in the digital era: Challenges and adaptive strategies for MSMEs

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## Abstract

Digital transformation has become a demand for MSMEs in increasing production efficiency and encouraging product innovation. This study aims to analyze the challenges and adaptive strategies faced by MSMEs in the digitalization era. The method used is a literature study with a qualitative approach, through tracing and analyzing scientific sources related to MSME digitalization, production efficiency, and product innovation. The results of the study show that digitalization provides great opportunities for MSMEs in expanding markets, saving operational costs, and increasing competitiveness. However, MSMEs still face various obstacles such as low digital literacy, limited access to technology, and resistance to change. The adaptive strategies identified include digital literacy training, the use of social media and e-commerce for marketing, and collaboration between MSMEs, the government, and technology providers. The conclusion of this study emphasizes the importance of synergy between increasing human resource capacity, technology infrastructure support, and pro-digital policies to create a resilient and sustainable MSME business ecosystem in the digital era.

**Keywords:** MSME digitalization, production efficiency, product innovation, adaptive strategy

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## 1. Introduction

In the ever-evolving landscape of global business, the digital era has brought about fundamental changes, including for Micro, Small, and Medium Enterprises (MSMEs). Digitalization is not merely a temporary trend but a necessity for MSMEs that aim to remain competitive and relevant in the modern economy. With technological advancements such as the Internet of Things (IoT), big data analytics, and artificial intelligence (AI), MSME players have a significant opportunity to enhance production efficiency, accelerate product innovation, and expand market reach through digital platforms. This transformation enables the optimization of business processes, reduction of production costs, and continuous improvement in product quality and competitiveness.

However, despite the numerous advantages offered by the digital era, Micro, Small, and Medium Enterprises (MSMEs) also face several challenges that must be addressed. One of the main obstacles is the limited access to technology and digital infrastructure, which remains a barrier for many small business owners. A significant number of MSMEs still rely on conventional methods, creating a gap in technology adoption that poses a serious challenge to embracing digital innovation. In addition, the low level of digital literacy among MSME actors exacerbates the situation, as the lack of understanding about the benefits and

functionality of technology makes it difficult for them to utilize digital platforms effectively (Fitra & Fajri, 2025). MSMEs are widely recognized as the backbone of national economic growth. This strategic role arises from their ability to reduce poverty by creating employment opportunities and promoting more equitable distribution of development outcomes. Nevertheless, MSMEs often encounter obstacles, one of which is the underutilization of promotional materials. in product marketing, which results in low profits. (Consoli & Cesaroni, 2015)

Conventional marketing has made it difficult for MSMEs to compete with large companies that already possess extensive market networks. Therefore, innovation is needed through the utilization of social media as a means to introduce products. Technology-based digital marketing offers various benefits for business actors, such as facilitating the delivery of product information, improving operational efficiency, expanding market reach, and making it easier for consumers to recognize product choices and conduct transactions (Paramita & Surur, 2022).

In addition to technical barriers, resistance to change is also a factor that slows down the digital transformation of MSMEs. Some business owners tend to stick to traditional business methods due to uncertainty and concerns about potential financial and operational risks. However, without adapting to continuously evolving technology, MSMEs risk falling behind in an increasingly competitive market. Therefore, a comprehensive adaptive strategy is needed to enable MSMEs to overcome these challenges and effectively leverage the digital era. Enhancing human resource capacity through digital training and education is a key step in equipping MSME actors with the necessary skills for transformation. In addition, investing in technology that aligns with the scale and needs of the business should be considered, so that MSMEs can improve production efficiency without being burdened by high costs (Farhani et al., 2021).

In addition to internal factors, the digital business ecosystem must also be strengthened through collaboration between MSMEs, the government, and technology providers. Support in the form of policies that promote digitalization, such as incentives for MSMEs investing in technology, subsidies for digital devices, and improved access to e-commerce platforms and digital marketing, can serve as a key catalyst in accelerating MSME transformation. With the right approach, MSMEs can not only enhance production efficiency but also develop product innovations that are more responsive to the ever-changing needs of the market. Digitalization not only presents challenges but also offers great opportunities for MSMEs to grow and strengthen their position in the global digital economy (Astuti & Rosita, 2024).

This article aims to analyze the impact of digitalization on MSMEs by highlighting how digital technology contributes to improving production efficiency and product innovation. Digitalization offers opportunities for MSMEs to expand their markets and increase their competitiveness in an increasingly dynamic business ecosystem.

## **2. Research Design and Method**

This research employs a qualitative approach using a library research method as the foundation for analyzing production efficiency and product innovation in MSMEs in the digital era. The qualitative theory of literature study in the context of production efficiency and product innovation focuses on the analysis and interpretation of concepts developed in various academic sources. This approach allows researchers to gain an in-depth understanding of MSMEs' adaptive strategies in facing the challenges of digitalization without relying on qualitative data collection. Literature studies help compile and synthesize various references that discuss production efficiency, product innovation, and the adoption of digital technology in MSME businesses. Throughout the process, this theoretical framework prioritizes the analysis and interpretation of published ideas, resulting in a comprehensive mapping of challenges and solutions for MSMEs in enhancing their competitiveness in the digital era.

The literature study method was chosen because the aim of this research is to gain a comprehensive

understanding of the concepts, challenges, and adaptive strategies of MSMEs in facing the digital era, by referring to various existing scholarly sources. The data used in this study were obtained from a range of relevant references, including national and international journals, scientific articles, research findings, and official government documents related to digitalization and MSME development.

Data were collected through a literature search using keywords such as "MSME digitalization," "product innovation," "production efficiency," and "adaptive strategies for MSMEs." The search was conducted through various online databases, such as Google Scholar, DOAJ, and university journal portals. Through this literature-based approach, the researcher is able to construct a theoretical and conceptual understanding of how MSMEs can enhance their competitiveness amid the challenges of the digital era. Moreover, this approach also helps in formulating strategic recommendations based on previous findings that have been academically validated.

### **3. Results and Discussion**

Digital transformation in today's business world is no longer just an option. It has become a fundamental necessity, especially for Micro, Small, and Medium Enterprises (MSMEs). Amid technological advancements such as the Internet of Things (IoT), big data analytics, and artificial intelligence (AI), MSMEs have significant opportunities to enhance production efficiency and expand their market reach. However, they also face challenges such as limited access to digital infrastructure and low levels of technological literacy, which can hinder the optimization of their business processes and overall productivity (Putra & Suharyadi, 2023).

Marketing efforts that still rely on conventional methods result in limited competitiveness compared to large companies that are already digitally integrated in reaching markets (Consoli & Cesaroni, 2015). Social media and other digital platforms have proven effective in helping MSMEs access broader markets. The application of digital technology in marketing not only improves communication efficiency but also makes it easier for consumers to discover and purchase products. This offers significant advantages in terms of time, cost, and reach, benefits that were difficult to achieve through traditional methods. One strategy that has proven effective is the use of social media and digital platforms as marketing tools. Digital technology enables MSMEs to quickly disseminate product information and access wider market segments. This innovation not only enhances promotional cost-efficiency but also helps consumers more easily recognize, evaluate, and purchase MSME products (Paramita & Surur, 2022).

However, the shift toward digitalization is not always welcomed positively. Many MSME actors feel unprepared or hesitant to leave conventional systems due to concerns about cost risks and uncertain outcomes. Adaptive strategies, including technology training and improving digital literacy, are key to overcoming this resistance. Adequate knowledge and skills will accelerate the technology adoption process. Technology investments need to be tailored to the scale and needs of MSMEs so that they do not become a burden but rather drive growth. The compatibility of technology with the business model and the internal capacity of business actors is crucial for the success of digital transformation. Without proper planning and implementation, these investments can become ineffective or even detrimental (Farhani & Chaniago, 2021).

The government, technology providers, and the private sector have important roles in creating an inclusive digital ecosystem for MSMEs. Policy support such as subsidies for digital devices, free training, and access to e-commerce platforms will greatly help accelerate the digitalization process. Synergistic collaboration among these stakeholders will strengthen the foundation of MSMEs in facing the changes of the times (Astuti & Rosita, 2024).

Micro, Small, and Medium Enterprises (MSMEs) are forms of businesses run individually and carry a high risk of losses if the promotional strategies applied are ineffective. Many MSME actors face difficulties in attracting customers due to a lack of thorough marketing planning; often, they start businesses

without considering long-term strategies. In today's digital era, technology plays a crucial role in business success, encouraging MSME players to utilize various technological solutions to develop their businesses. From communication and operations to marketing, digitalization opens opportunities for MSMEs to improve operational efficiency and strengthen their competitiveness in the market.

Technology has become an integral part of human life, with nearly every activity now relying on technological assistance. One of the most influential developments is digital technology, which enables systems to operate automatically without requiring manual human labor. This technology operates based on computerized systems with electrical signals as its foundation. With its advanced capabilities, digital technology provides significant benefits for human life sustainability, including increased efficiency, faster access to information, and ease in various aspects of life (Amilia et al., 2024). Below are some of the benefits of digital technology:

1. **Access to Information:** With this technology, it becomes easier for individuals to search for information from various sources with quick access. These data sources can be obtained from online databases, social media, and global electronic devices. Thus, having access to such information enables people to learn and acquire knowledge more efficiently than relying solely on traditional methods.
2. **Easier Communication:** Digital technology has transformed the way people communicate. This includes making voice or video calls, as well as sending text messages via email or instant messaging applications. This has made long-distance communication, whether between different islands or countries, simpler and more efficient.
3. **Increased Productivity:** Technology that supports productivity can help both in the workplace and in daily life. For example, the use of software applications that manage tasks can make it easier to organize work data efficiently.

With the increasingly significant role of digital technology in daily life, business actors need to seize opportunities by integrating their businesses with digital technology. Through this integration, digital technology can directly contribute to the success of MSMEs by helping to improve operational efficiency, expand market reach, and support more innovative business strategies. The factors include the following:

1. **Enhancing Marketing and Promotion Access:** With digital technology, business actors can carry out targeted promotions in various ways, such as creating websites, promoting on social media, and establishing online marketplaces used for promotion, allowing the public to recognize the MSMEs.
2. **Improving Operational Efficiency:** Operational activities often become obstacles if not managed properly. Digitalization facilitates users in organizing activities such as managing data and transactions between sellers and consumers.
3. **Increasing Product and Service Innovation:** In the midst of increasingly intense business competition, it is important for business actors to continuously develop products and services to remain relevant and competitive in the market. Adapting to consumer needs is key to attracting interest in MSME products. Through digitalization, gaining inspiration becomes easier as various information can be accessed quickly and at no cost (Sitorus et al., 2024).

Digital transformation demands that MSMEs adopt adaptive strategies to enhance their competitiveness. The digitalization of economic policies encourages MSMEs to develop flexible, technology-based business strategies. The success of MSME digitalization is influenced by infrastructure readiness, digital literacy, and technology-oriented policy support. Collaboration among the government, private sector, and MSME actors is crucial in building a competitive business ecosystem in the digital era (Alke Mega, 2025).

Digital marketing through social media has become a key factor in the success of MSMEs in expanding their markets. Ayu Indah Lestari and Dr. Joko Purwono (2024) state that social media has become an essential element in business activities and digital marketing strategies among MSMEs. By leveraging

technology and social media, MSMEs can expand their marketing networks more efficiently. However, the digitalization process still faces various challenges, such as lack of understanding and limited access to information, resulting in suboptimal use of digital marketing by MSME actors. The utilization of digital technology in product innovation enables MSMEs to broaden their market reach. Through digitalization, MSMEs can market and sell their products or services online via e-commerce platforms and use social media as a promotional tool. Engaging and relevant content on social media can increase brand exposure and attract new consumer interest. Additionally, the use of data analytics provides deeper insights into business performance and consumer behavior, helping MSMEs make more precise strategic decisions (Setiawan & Nugroho, 2023).

#### 4. Conclusions

Digital transformation has a significant impact on production efficiency and product innovation for MSMEs. Findings from the literature review show that digitalization can increase productivity, expand market reach, and strengthen the competitiveness of MSMEs through the use of technologies such as social media, e-commerce, big data, and artificial intelligence. The advantages of digital transformation include its ability to reduce operational costs, accelerate business processes, and create product innovations that align with market needs. However, there are several challenges, including low digital literacy among MSME actors, limited access to technological infrastructure, and resistance to change from traditional work patterns to digital methods. These issues highlight a gap between the goal of promoting MSME digitalization and the actual conditions on the ground, which are not yet fully supportive.

Therefore, future development efforts should focus on enhancing human resource capacity through continuous digital training, providing equitable technological infrastructure, and implementing proactive government policies to support MSMEs toward an inclusive and sustainable digital business ecosystem. Based on the synthesis of problems, objectives, and findings reviewed, it can be concluded that digitalization represents a strategic opportunity that must be fully optimized so that MSMEs can adapt and grow amidst changing times.

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