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Analysis of the Role of Digital Technology in Driving Business Model Innovation in MSMEs: Implications for Enhancing Operational Efficiency and Sustainable Economic Growth

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ABSTRACT

This study analyzes the role of digital technology in driving business model innovation in Micro, Small, and Medium Enterprises (MSMEs) and its implications for enhancing operational efficiency and sustainable economic growth. Using a qualitative approach based on a literature review, this study examines literature from Google Scholar for the 2020-2025 period, with a rigorous selection process yielding 20 articles as the basis for analysis. The findings indicate that the adoption of digital technology, including e-commerce, social media, cloud-based systems, and operational automation, enables MSMEs to enhance their competitiveness, expand market reach, and optimize business management. Case studies from various sectors, such as Kopi Kenangan, Sage Footwear, CV Sinar Baja Electric, and Du Anyam, demonstrate that digital technology contributes to accelerating business processes and creating more adaptive and environmentally friendly business models. However, challenges such as limited digital literacy, infrastructure access, and MSME readiness in adopting technology remain significant barriers. Therefore, more inclusive policies, improved access to digital training, and collaboration between the government, private sector, and business communities are necessary to support the optimal digital transformation of MSMEs.

ABSTRAK

Penelitian ini menganalisis peran teknologi digital dalam mendorong inovasi model bisnis pada Usaha Mikro, Kecil, dan Menengah (UMKM) serta implikasinya terhadap peningkatan efisiensi operasional dan pertumbuhan ekonomi berkelanjutan. Dengan pendekatan kualitatif berbasis tinjauan pustaka, penelitian ini mengkaji literatur dari Google Scholar periode 2020-2025, dengan seleksi ketat menghasilkan 20 artikel sebagai dasar analisis. Hasil penelitian menunjukkan bahwa adopsi teknologi digital, termasuk e-commerce, media sosial, sistem berbasis cloud, dan otomatisasi operasional, memungkinkan UMKM meningkatkan daya saing, memperluas jangkauan pasar, serta mengoptimalkan manajemen bisnis mereka. Studi kasus dari berbagai sektor, seperti Kopi Kenangan, Sage Footwear, CV Sinar Baja Electric, dan Du Anyam, membuktikan bahwa teknologi digital berkontribusi dalam mempercepat proses bisnis dan menciptakan model bisnis yang lebih adaptif serta ramah lingkungan. Namun, tantangan seperti keterbatasan literasi digital, akses infrastruktur, serta kesiapan UMKM dalam mengadopsi teknologi masih menjadi kendala utama. Oleh karena itu, diperlukan kebijakan yang lebih inklusif, peningkatan akses terhadap pelatihan digital, serta kolaborasi antara pemerintah, sektor swasta, dan komunitas bisnis untuk mendukung transformasi digital UMKM secara optimal.

1. INTRODUCTION

The development of digital technology has become a key factor in business transformation across various sectors, including Micro, Small, and Medium Enterprises (MSMEs). Digital technology enables MSMEs to adopt innovative business models that enhance competitiveness and significantly expand their markets. In

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the current digital era, various platforms such as e-commerce, social media, cloud computing, and data analytics provide substantial opportunities for MSMEs to optimize their operations at lower costs. The adoption of digital technology allows MSMEs to enhance operational efficiency by reducing reliance on manual processes and improving decision-making accuracy through data-driven insights (Ausat et al., 2022). Thus, the role of digital technology in MSME business model innovation is crucial in building their economic resilience and competitiveness.

Digitalization in MSMEs has also transformed how businesses interact with customers and improved the effectiveness of marketing and distribution strategies. Technologies such as artificial intelligence (AI) and data analytics enable MSMEs to gain deeper insights into customer preferences, allowing them to offer more personalized and relevant products or services. Additionally, digital platforms such as online marketplaces and social media help MSMEs reach consumers beyond their geographical boundaries, ultimately increasing sales volume and business expansion (Ausat & Suherlan, 2021). This digital transformation has also created new opportunities for developing technology-based products, such as Internet of Things (IoT)-enabled products or application-based services, which are increasingly adopted by MSMEs across various industries.

Beyond benefits in marketing and sales, digital-based business model innovation also contributes to MSMEs' operational efficiency (Teoh et al., 2023). The implementation of Enterprise Resource Planning (ERP) systems and the use of digital accounting software allow MSMEs to manage supply chains, inventory, and cash flow more efficiently. With integrated digital systems, MSMEs can reduce operational costs and enhance transparency in business management. This increased efficiency impacts internal productivity and accelerates the cycle of innovation and product development, enabling MSMEs to meet market demands more dynamically.

The application of digital technology also positively impacts the long-term sustainability of MSMEs. Technology enables MSMEs to reduce operational waste by adopting circular economy concepts, such as material reuse, supply chain optimization, and the implementation of environmentally friendly business strategies. Furthermore, digitalization supports business models based on the sharing economy, where MSMEs can optimize the use of existing assets or resources through various sharing platforms (Zuhroh et al., 2025). Thus, digital-based business model innovation enhances MSME profitability while contributing to more sustainable economic growth.

Although digital technology offers numerous opportunities for Micro, Small, and Medium Enterprises (MSMEs), its adoption still faces various challenges. Factors such as limited access to digital infrastructure, lack of digital literacy among MSME entrepreneurs, and insufficient capital for technology investments remain major obstacles to MSME digital transformation (Ausat & Peirisal, 2021). Additionally, resistance to change and a lack of skills in managing digital technology often hinder the successful implementation of digitalization. Therefore, interventions from various stakeholders, including the government, educational institutions, and the private sector, are necessary to strengthen the digital ecosystem for MSMEs, enabling them to access technology more easily and enhance their digital capabilities.

The government plays a crucial role in promoting MSME digitalization through policies that support technology adoption, such as tax incentives for digital investments, digital skills training, and improvements in internet infrastructure, particularly in rural areas. Furthermore, programs that facilitate access to financing for MSMEs looking to invest in digital technology are critical steps in accelerating digital transformation in this sector. Meanwhile, collaborations with technology companies and academic institutions can serve as a solution to enhance digital literacy and technical skills, enabling MSMEs to fully leverage digital technology.

From an economic perspective, the digital business model innovations adopted by MSMEs have a significant impact on overall economic growth. Digitalization enables MSMEs to enhance their competitiveness in the global market, create new job opportunities, and increase their contribution to national GDP (Adinda et al., 2024). Digitally transformed MSMEs can generate a multiplier effect on other sectors with increased productivity and operational efficiency, such as logistics, manufacturing, and financial services. This means that accelerating digital technology adoption in MSMEs is not only a strategy to enhance individual business competitiveness but also a strategic approach to driving inclusive and sustainable economic growth.

Based on the aspects discussed, this study aims to analyze the role of digital technology in driving business model innovation in MSMEs and its implications for improving operational efficiency and sustainable economic growth. This research is expected to provide deeper insights into effective digital transformation strategies and policy recommendations that can support the sustainability and competitiveness of

MSMEs in an increasingly digitalized business ecosystem by understanding how digital technology can be optimally utilized by MSMEs.

2. THEORETICAL FRAMEWORK AND HYPOTHESES

Digital Technology

Digital technology refers to various digital-based tools, systems, and infrastructures that enable automation, data processing, and more efficient communication in various business activities (Hoehe & Thibaut, 2020). This technology includes software, e-commerce platforms, artificial intelligence, cloud computing, the Internet of Things (IoT), and social media, all of which help businesses expand market reach, enhance customer interactions, and optimize supply chain management. For Micro, Small, and Medium Enterprises (MSMEs), adopting digital technology enables operational efficiency, access to digital financial services, and ease in marketing and product distribution. However, challenges in implementing digital technology remain, particularly due to low digital literacy, infrastructure limitations, and the readiness of business owners to adopt technology-driven innovations.

Business Model Innovation

Business model innovation refers to changes or developments in business strategies aimed at creating new value for customers and enhancing a company's competitive advantage (Li et al., 2022). This innovation may involve transformations in how a company creates, delivers, and captures value, such as through service digitalization, adopting subscription-based models, or integrating technology into production processes. In the MSME context, business model innovation often focuses on leveraging digital platforms to reach a broader customer base, diversifying revenue streams, and optimizing operational efficiency through data utilization and automation. MSMEs can become more adaptive to market changes with the right innovations, reduce reliance on conventional methods, and improve their competitiveness in an increasingly dynamic industry.

MSMEs

MSMEs are an economic sector comprising small to medium-scale businesses that play a crucial role in a country's economy, particularly in job creation and increasing community income (Harahap et al., 2023; Subagja et al., 2023). MSMEs often face limitations in capital, human resources, and access to markets and technology. However, their flexibility and adaptability allow for rapid innovation and growth when supported by appropriate policies. Digitalization has created new opportunities for MSMEs to overcome various challenges by utilizing e-commerce platforms, digital payments, and technology-based financial services. MSMEs can become more competitive both nationally and globally while making a more significant contribution to economic development with the increasing adoption of technology.

Operational Efficiency

Operational efficiency refers to a business's ability to optimize its resources to achieve maximum output at minimal cost (Handoyo et al., 2023). In the MSME context, operational efficiency can be achieved through the adoption of digital technology, which automates business processes, enhances workforce productivity, and reduces unnecessary operational costs. For instance, the use of digital accounting software can save time in financial record-keeping, while cloud-based inventory management systems can help businesses maintain more accurate stock control. MSMEs can increase profitability, accelerate business growth, and remain competitive in an increasingly dynamic market environment by improving operational efficiency.

Sustainable Economic Growth

Sustainable economic growth is a concept that emphasizes economic development without compromising environmental and social balance (Ginting, 2020). In the MSME context, sustainable economic growth can be achieved by adopting business models that focus on profitability while considering long-term environmental and social impacts. The use of digital technology can help MSMEs reduce their carbon footprint, improve resource efficiency, and create more inclusive and environmentally friendly business models. MSMEs can play a strategic role in driving more stable with the support of proper regulations and policies, inclusive, and sustainable economic growth while generating positive social impacts for local communities.

3. RESEARCH METHOD

This study is a literature review with a qualitative approach aimed at analyzing the role of digital technology in driving business model innovation in MSMEs and its implications for improving operational efficiency and achieving sustainable economic growth. This method is used to understand concepts, theories, and empirical findings discussed in previous research to gain a deeper understanding of the phenomenon under study. In this research, descriptive analysis is employed to systematically present and interpret data based on various relevant literature sources. Descriptive analysis aims to illustrate how digital technology contributes to business model innovation in MSMEs and its impact on operational aspects and economic growth. Through this approach, the study identifies existing trends and patterns in the literature and explores the interrelationships between the examined variables. The data for this study were obtained from various scientific articles published on Google Scholar within the period of 2020-2025. This timeframe was chosen to ensure that the data used are up-to-date and relevant to the latest developments in digital technology and MSME business model innovation. The data collection process began with searching for articles using keywords relevant to the research topic, such as "digital technology in MSMEs," "digital business model innovation," "MSME operational efficiency," and "digital economy growth." In the initial stage, 40 scientific articles related to the research topic were identified. However, after a rigorous selection process based on relevance, source credibility, and alignment with the research focus, the final number of articles included in the analysis was reduced to 20. The selection process considered factors such as the research methodology used in each article, relevance to MSMEs, and the article's contribution to providing deeper insights into the studied phenomenon. The findings from the reviewed articles were then analyzed thematically to identify patterns, challenges, and opportunities in the adoption of digital technology by MSMEs. This analysis was conducted by categorizing key findings in the literature into several main themes, such as digital technology adoption in MSMEs, business model transformation, impact on operational efficiency, and implications for economic growth. Thus, this study is expected to provide a comprehensive overview of how digital technology contributes to MSME development and offer strategic recommendations for relevant stakeholders.

4. DATA ANALYSIS AND DISCUSSION

Digital technology has become a key catalyst in the transformation of MSMEs, enabling them to adapt to market changes through more flexible and data-driven business models. Digitalization reduces operational costs by automating business processes and accelerates product and service innovation that better aligns with customer preferences, increasingly driven by data analytics and artificial intelligence. The presence of e-commerce platforms such as Tokopedia and Shopee expands market reach nationally and internationally while providing access to a digital ecosystem that includes electronic payment systems, technology-based logistics services, and algorithm-driven marketing strategies that enhance product visibility more efficiently than physical stores. Additionally, the integration of AI-powered chatbots and personalized shopping experiences allows MSMEs to build stronger relationships with customers, increase loyalty, and optimize consumer satisfaction (Khana et al., 2023). MSMEs can develop dynamic pricing strategies and more effective promotions by leveraging customer data more effectively, thereby enhancing their competitiveness in an increasingly intense market, making digitalization the primary foundation for business growth and sustainability in the digital economy era.

The utilization of social media by MSMEs serves as both a marketing tool and a strategy to build a more loyal customer community while gaining real-time insights into market trends through data analytics. For example, Sage Footwear leverages Instagram and TikTok to increase brand awareness and create interactive shopping experiences through live shopping features that encourage impulsive buying decisions, as well as precisely targeted paid advertisements based on user preferences and behavior (Permana, 2021). Social platform algorithms allow MSMEs to reach audiences more relevant to their products, while analytics features provide deep insights into customer demographics, campaign effectiveness, and market trends that can be used to craft more adaptive marketing strategies. Furthermore, direct interactions with customers through comments, direct messages, and reviews enable MSMEs to build trust and brand credibility, ultimately contributing to increased customer loyalty and long-term retention. MSMEs can compete more effectively with larger brands without incurring the high costs associated with traditional marketing by combining creative content marketing strategies, influencer collaborations, and data-driven ad optimization, making social media a key element in digital business growth.

The implementation of digital technology in MSME operations enhances efficiency and enables more

accurate data-driven decision-making, accelerates responses to market dynamics, and improves overall customer experience. For instance, Kopi Kenangan relies on cloud-based point-of-sale (POS) systems to manage transactions, monitor raw material stock, and analyze sales patterns in real-time, allowing them to optimize supply chains and minimize the risk of stock shortages or excess inventory (Blog, 2024). With this technological integration, MSMEs can implement more precise demand forecasting strategies, reduce raw material wastage, and improve labor efficiency by automating cashier processes and financial reporting. Additionally, POS technology connected to customer loyalty applications helps MSMEs build long-term relationships with consumers through data-driven reward systems and promotions, ultimately driving customer retention and repeat purchases. MSMEs can also respond more quickly to market trends with an integrated digital system, such as adjusting menus or pricing strategies based on transaction data, ensuring they remain competitive in a dynamic industry. Operational digitalization not only enhances efficiency and profitability but also unlocks broader innovation opportunities in business models.

The utilization of Internet of Things (IoT) technology and automation in the manufacturing sector increases productivity and allows MSMEs to optimize supply chains, reduce production errors, and enhance global market competitiveness. A case study of CV Sinar Baja Electric, a speaker manufacturer from Surabaya, demonstrates how integrating technology-driven manufacturing systems improves production efficiency by automating various processes such as assembly, quality inspection, and real-time inventory management (Reynardo & Sepadyati, 2022). With IoT sensors, the company can monitor machine conditions and raw materials, reducing downtime and preventing damage that could increase maintenance costs. Moreover, digitalization in production systems enables the implementation of lean manufacturing strategies by minimizing production waste and optimizing raw material usage. This reduces labor costs through automation while ensuring consistent product quality standards that meet export regulations and compete with global brands. Another advantage is the company's ability to analyze production data to make quicker adjustments to market trends and customer demands, ensuring flexibility in adapting to industry dynamics. Thus, the adoption of digital technology in the manufacturing sector enhances operational efficiency and profitability while serving as a fundamental driver for MSMEs to grow and enter international markets with greater competitiveness.

Digitalization has created opportunities for MSMEs to adopt more sustainable business models by integrating green economy principles and social inclusivity into their operational strategies, as demonstrated by Du Anyam, a social MSME that empowers woven craft artisans in East Nusa Tenggara through digital technology. Du Anyam has been able to reach global markets without relying on conventional supply chains by utilizing e-commerce and digital marketing, which often increase carbon footprints, while ensuring transparency in production processes that support fair labor practices for local artisan communities (Du Anyam, 2020). Additionally, digitalization enables Du Anyam to implement a more efficient inventory management system, reducing raw material wastage and ensuring optimal resource utilization, aligning with circular economy principles. By leveraging digital platforms, this MSME can also raise consumer awareness of the importance of sustainable products while building a strong brand narrative through digital storytelling that highlights the social and environmental impact of each product sold. Du Anyam’s success in combining technology with community economic empowerment proves that digitalization is not only a tool for business expansion but also a catalyst for more inclusive, sustainable, and environmentally responsible economic growth.

Despite the various benefits that digital technology offers to MSMEs, its adoption remains hindered by low digital literacy, infrastructure limitations, and the lack of adequate ecosystem support, especially in rural areas. Many MSME entrepreneurs in Central Java, for instance, still rely on traditional business operations due to a lack of understanding of how digitalization can improve efficiency and profitability (Birokrasi, 2025). Additionally, uneven internet access and the perception of high technology implementation costs are major barriers to MSME digital transformation in these regions. Studies show that without continuous mentoring, MSMEs tend to struggle in adopting digital systems such as e-commerce, electronic payments, and cloud-based inventory management, which could otherwise enhance their competitiveness (Suroto, 2023). Therefore, government intervention in the form of technology subsidies, equitable digital infrastructure provision, and training programs tailored to the specific needs of MSMEs is crucial to ensuring effective technology adoption. On the other hand, the private sector also plays a strategic role in providing more affordable technological solutions and fostering partnerships with MSMEs to accelerate digitalization. Collaboration between the government, technology companies, and educational institutions can create an ecosystem that

enables MSMEs to access and effectively utilize technology to enhance their productivity and competitiveness in an increasingly digital market.

Efforts to overcome barriers to digital technology adoption among MSMEs continue through various assistance programs that emphasize digital skills training, access to technology, and the facilitation of a digital-based business ecosystem. The "1000 Digital Startup National Movement," supported by the Ministry of Communication and Informatics, focuses on building MSMEs' digital capacity through training that includes digital marketing strategies, e-commerce optimization, and the use of financial technology to enhance operational efficiency. Meanwhile, the "Gojek Wirausaha" initiative offers a needs-based approach for MSME entrepreneurs, helping them understand how to use digital applications to market products, manage transactions more efficiently, and build stronger customer relationships through online platforms (Putra, 2021). These programs demonstrate that continuous intervention from various stakeholders, including the government, private sector, and business communities, can accelerate the digital transformation of MSMEs by providing access to skills and resources that were previously difficult to obtain. Moreover, such collaborations also create an environment that supports innovation and inclusive technology adoption, enabling MSMEs, both in urban and rural areas, to have greater opportunities to compete in the digital market. With the right strategy, digital mentoring can enhance technology literacy and encourage MSMEs to be more adaptive to market changes, improve operational efficiency, and open up business expansion opportunities at the national and global levels.

Based on various case studies from the e-commerce, manufacturing, and social enterprise sectors, digital technology has proven to be a key factor in transforming MSME business models by increasing operational efficiency, expanding market reach, and accelerating production and distribution processes. The utilization of digital platforms such as marketplaces, social media, and cloud-based systems enables MSMEs to optimize resources, reduce operational costs, and enhance customer interactions more effectively. However, while digital technology presents significant opportunities, challenges related to digital literacy, limited access to technology infrastructure, and resistance to change remain major obstacles, particularly for MSMEs in rural areas and businesses with limited capital. Therefore, collaborative efforts from the government, private sector, and educational institutions are crucial in the form of policies supporting digitalization, more equitable infrastructure provision, and continuous training programs to ensure that MSMEs can maximize technology adoption. With a comprehensive approach, MSME digitalization will enhance individual business competitiveness, drive more inclusive and sustainable economic growth, create a more innovative business ecosystem, and accelerate the integration of Indonesian MSMEs into the global digital economy.

5. CONCLUSION, IMPLICATION, SUGGESTION, AND LIMITATIONS

This study demonstrates that digital technology plays a crucial role in driving business model innovation among MSMEs, positively impacting operational efficiency and sustainable economic growth. Digitalization enables MSMEs to access broader markets through e-commerce, enhance customer interaction through social media, and optimize business processes using cloud-based systems and automation. Case studies from various sectors, such as Kopi Kenangan, Sage Footwear, CV Sinar Baja Electric, and Du Anyam, illustrate that digital transformation can improve MSME competitiveness, reduce operational costs, and create more adaptive and sustainable business models. However, the adoption of digital technology still faces challenges, particularly in terms of digital literacy and infrastructure access, which hinder the digital transformation of MSMEs in various regions.

The findings of this study have implications for MSME entrepreneurs, the government, and the private sector in promoting more inclusive digital transformation. For MSMEs, leveraging digital technology is a tool to enhance operational efficiency and a key strategy for developing innovative and highly competitive business models. For the government, the study highlights the importance of policies that support MSME digitalization, including improved access to digital infrastructure and technology literacy training. Meanwhile, the private sector, particularly technology-based companies such as marketplaces, fintech firms, and digital service providers, must continue collaborating with MSMEs to offer accessible, affordable, and easy-to-adopt solutions for small and medium-sized businesses.

To optimize digital technology for business model innovation, several strategic steps must be taken. First, MSMEs need to enhance digital literacy through more structured training on technology utilization for marketing, financial management, and business operations. Second, the government must expand internet access in areas lacking adequate digital infrastructure to ensure widespread MSME digital transformation.

Third, the private sector needs to provide more technology-based solutions tailored to MSME needs, such as simplified ERP systems, user-friendly digital payment solutions, and data-driven marketing platforms. Fourth, ongoing mentoring and coaching programs involving business communities, academics, and industry practitioners are necessary to help MSMEs effectively adopt technology.

This study has several limitations that should be considered. First, as a literature review, it relies solely on secondary data from available literature between 2020 and 2025, which may not directly reflect the real experiences of MSMEs in the field. Second, this study has not deeply explored differences in digital technology adoption levels based on industry sectors or geographical locations of MSMEs, which could provide more specific insights into the challenges and opportunities of digital transformation in various contexts. Third, it does not cover the long-term impact of digital technology adoption on MSME sustainability, including potential social and environmental effects. Further research based on empirical data and in-depth case studies across different MSME sectors is needed to strengthen the findings presented in this study.

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