

A SYSTEMATIC LITERATURE REVIEW: CHALLENGES AND OPPORTUNITIES FOR MICRO, SMALL, AND MEDIUM ENTERPRISES (MSMEs) IN THE DIGITAL ERA



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Abstract

This systematic literature review explores the challenges and opportunities faced by micro, small, and medium enterprises (MSMEs) in the digital era. The study aims to identify and analyze the challenges and opportunities faced by micro, small, and medium enterprises (MSMEs) in the digital era. The research method used was a comprehensive search of relevant literature using predetermined search criteria, resulting in 320 articles meeting the criteria. These articles were further screened based on their relevance to the research questions, and ultimately, 58 articles were selected for analysis. The results of the study indicate that the digital era offers significant opportunities for MSMEs, particularly in terms of increased access to markets, resources, and information. However, MSMEs also face various challenges, including a lack of digital literacy, limited resources, and intense competition. This study highlights the need for MSMEs to embrace digital technology and develop strategies to address these challenges. Overall, this systematic literature review provides valuable insights into the challenges and opportunities for MSMEs in the digital era and emphasizes the importance of adapting to the changing business landscape. The findings of this study have practical implications for policymakers, MSMEs, and other stakeholders interested in MSME development in the digital era.

Keywords: MSMEs, Digitalization, Industry 4.0, Economy

INTRODUCTION

In today's digital era, information and communication technology has brought significant changes to various aspects of life, including the business world. In the business world, digital technology has facilitated easier access and use of information, increasing efficiency and productivity. However, at the same time, digital technology has also created new challenges for small and medium enterprises (MSMEs).

MSMEs worldwide play a vital role in national and local economies (Khan, 2014). However, in this digital era, MSMEs face various challenges in adopting and optimally utilizing digital technology. Some of these challenges include difficulties in accessing technology and skilled human resources, as well as a lack of digital knowledge and skills.

In this context, research examining the challenges and opportunities for MSMEs in the digital era is crucial. However, there is currently a wide range of research on this topic, and a lack of a comprehensive understanding of the challenges and opportunities facing MSMEs in the digital era remains a challenge. Therefore, conducting systematic research examining the challenges and opportunities for MSMEs in the digital era can provide a better understanding of this topic. This research can provide insights and practical recommendations for business actors, governments, and other stakeholders in supporting the growth and success of MSMEs in the digital era.

Digitalization is a rapidly evolving phenomenon that has impacted many aspects of human life, including business, communication, and social interaction. Accordingly, several international journals have published articles exploring the theoretical underpinnings of digitalization across various domains. In the field of entrepreneurship, researchers have examined the impact of digitalization on business models and innovation. For example, Chesbrough (2010) argues that digital technology has created new opportunities and challenges for business model innovation. Teece (2010) highlights the importance of business models in facilitating innovation in the digital era. In the field of information systems, researchers have explored the role of digital technology in transforming organizations and society. Laudon and Laudon (2016) provide an overview of how information systems have been used to manage digital MSMEs, while Venkatraman (1994) explains how digital technology has enabled business transformation from automation to redefining the scope of business.

In the field of international political economy, researchers have examined the governance of global value chains facilitated by digital technology. Gereffi et al. (2005) argue that digitalization has led to the fragmentation of production across borders, creating new governance challenges for MSMEs and policymakers. In the innovation field, researchers have explored the potential of digital platforms and mass collaboration to foster innovation. Tapscott and Williams (2010) explain how wkinomics has enabled mass collaboration and open innovation, while West and Lakhani (2018) examine the role of expertise diversity and task autonomy in fostering crowd performance.

Finally, in the technology and society field, researchers have examined the broader implications of digitalization for human life and well-being. Brynjolfsson and McAfee (2014) explain how digital technology has led to a second machine age, while Castells (1996) argues that the rise of the network society has transformed social, economic, and political structures.

Overall, these theoretical perspectives offer insights into the complex and diverse nature of digitalization and its implications for various domains of human activity. By leveraging this perspective, researchers can gain a deeper understanding of the challenges and opportunities presented by digital technologies and develop strategies for MSMEs to navigate and effectively leverage them.

According to the International Finance Corporation (IFC), MSMEs are defined based on the number of employees, annual sales revenue, and total assets. Micro-enterprises typically have fewer than 10 employees, small-enterprises have up to 50 employees, and medium-enterprises have up to 250 employees. In terms of annual sales revenue, micro-enterprises typically have less than \$100,000, while small-enterprises have up to \$5 million and medium-enterprises up to \$50 million. Total assets can also be used as a criterion, with micro-enterprises having assets up to \$100,000, small-enterprises having up to \$10 million, and medium-enterprises having up to \$50 million. In the European Union (EU), MSMEs are defined based on the number of employees and annual turnover or balance sheet total. Micro-enterprises have up to 10 employees and an annual turnover or balance sheet total of up to €2 million, small-enterprises have up to 50 employees and an annual turnover or balance sheet total of up to €10 million, and medium-enterprises have up to 250 employees and an annual turnover or balance sheet total of up to €50 million. In the United States, the Small Business Administration (SBA) defines small businesses based on industry and number of employees or annual revenue. For example, in the manufacturing industry, a small business has up to 500 employees, while in the wholesale trade industry, a small business has up to 100 employees. Overall, although definitions and criteria for MSMEs vary across countries and regions, there are several common characteristics such as number of employees, annual sales revenue, and total assets. These definitions and criteria are important for policymakers, researchers, and practitioners to accurately identify and support MSMEs, which play a vital role in economic development and job creation.

REVIEW OF LITERATURE

Research on the digital transformation of MSMEs has grown substantially over the past decade, reflecting the increasing relevance of digital technology to small business survival and growth. Ali, Aziz, and Ashraf (2021) note that digital transformation reshapes nearly every operational aspect of small and medium enterprises, from internal processes to how they engage with customers, while also exposing firms to new risks tied to cost, capability, and change management. In a similar vein, Dąbrowska et al. (2022) argue that digital transformation carries a dual nature, generating both value creation and value destruction depending on how well an organization is prepared to absorb technological change, a tension that is particularly pronounced among resource-constrained MSMEs.

Several studies have examined MSME readiness to adopt digital technology. Aripin and Sarumpaet (2020) find that MSMEs in developing countries frequently lack the infrastructure, capital, and managerial capability required to fully engage with Industry 4.0, positioning readiness itself as a precondition rather than a guaranteed outcome of digitalization. Hooi, Wong, and Tan (2020), in their literature review of digitalization and SMEs, similarly conclude that adoption outcomes vary widely across firms and are shaped by internal factors such as owner mindset and external factors such as market pressure and

government support. Johnson (2020) adds that SMEs operating in the digital age face a shifting competitive landscape in which firms that fail to modernize risk being displaced by more agile, digitally native competitors.

Country and context-specific studies reinforce these findings. Kassim and Khalid (2020), studying SMEs in Malaysia, identify limited digital literacy, financing constraints, and inadequate technological infrastructure as the primary barriers to digitalization, while also noting that firms that overcome these barriers gain measurable improvements in efficiency and market reach. Tan, Lai, and Chua (2021) extend this discussion by highlighting that Malaysian SMEs that strategically adopt e-commerce and digital marketing tools are better positioned to expand beyond domestic markets. In the Indonesian context, several studies converge on similar themes. Darmawan (2020) reports that digitalization opens considerable business opportunities for Indonesian MSMEs but is often underutilized due to low digital literacy among business owners. Kristiadi (2019) and Susanto (2021) both emphasize the importance of structured development strategies, arguing that MSMEs need deliberate digital transformation roadmaps rather than ad hoc technology adoption. Kurniawan and Natsir (2019) frame this as a matter of balancing opportunity against challenge within the broader context of Industry 4.0, while Kusumo and Nuraini (2020) similarly describe digitalization as a double-edged development that requires supportive ecosystems to be fully realized. Putra and Ria (2019) and Safitri (2019) further show that MSMEs adopting digital tools tend to report gains in productivity and market access, though these gains are unevenly distributed across firm size and sector.

The role of external support structures also features prominently in the literature. Setiawan and Apriani (2021) demonstrate that government programs and financial institutions play a critical enabling role in helping MSMEs transition into the digital era, particularly through access to capital and digital training initiatives. This is consistent with Radovic-Markovic and Stanisic (2021), who argue that digitalization can significantly enhance SME competitiveness, but only when accompanied by adequate policy support and institutional capacity-building. Outside the Southeast Asian and European contexts, Madichie and Ibieta (2019) examine digital entrepreneurship among MSMEs in Nigeria and find comparable challenges, limited infrastructure, financing gaps, and skills shortages, suggesting that the barriers facing MSMEs in the digital era are, to a large extent, global rather than purely regional in nature.

Taken together, this body of literature suggests a consistent pattern: digitalization offers MSMEs meaningful opportunities for growth, market expansion, and efficiency, but realizing these benefits depends heavily on firm-level readiness, digital literacy, and the availability of external support. This convergence across studies from different countries and sectors provides the empirical foundation for the present systematic review, which seeks to synthesize these fragmented findings into a more comprehensive understanding of the challenges and opportunities MSMEs face in the digital era.

RESEARCH METHOD

This study employed a systematic literature review, a research methodology that aims to identify, evaluate, and synthesize all available evidence on a specific research question or topic. The purpose of a systematic literature review is to provide a comprehensive and

impartial summary of the existing literature on a particular subject. This study adopted the four stages of a systematic literature review according to Kitchenham et al. (2007), including: (1) Planning: This involves defining the research question or topic, selecting relevant databases and search terms, and developing inclusion and exclusion criteria for the literature search; (2) Conducting the search: This involves searching for relevant studies across various databases using predetermined search terms and inclusion criteria; (3) Screening and Selection: This involves reviewing the titles, abstracts, and full-text articles of identified studies to determine their relevance and eligibility for inclusion in the review; (4) Synthesizing the Evidence: This involves extracting data from included studies and synthesizing the findings using predetermined approaches, such as narrative synthesis, thematic analysis, or meta-analysis.

This study aims to systematically analyze the available literature on the challenges and opportunities of MSMEs in the digital era. A systematic literature search was conducted in databases, namely Crossref, Google Scholar, and Harzing Publish and Perish, which was used to help retrieve the most articles from top journals. Articles to be reviewed were obtained from journals such as Elsevier, Springer, and Research Gate. Each article selection process will be explained using the PRISMA model.

The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) model is a framework for conducting systematic reviews developed to improve the quality and transparency of reporting. The PRISMA model consists of four main stages: identification, screening, eligibility, and inclusion. The PRISMA model is widely recognized and used in the fields of systematic reviews and meta-analyses. This model can be adapted to different research questions and study designs, making it a flexible framework for conducting systematic reviews and meta-analyses (Moher D, 2009).

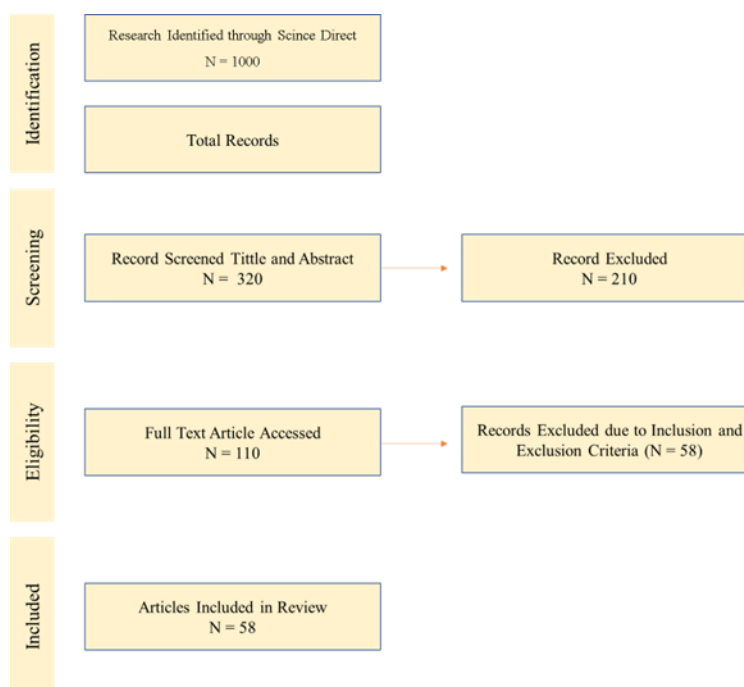
The keywords used in the journal search engine were micro, small, and medium-sized enterprises (MSMEs), digital era, challenges, opportunities, e-commerce, digitalization, and innovation. The following research questions will be answered in this study: (1) What are the challenges faced by MSMEs in the digital era?; (2) What opportunities are available to MSMEs in the digital era?; (3) How can MSMEs leverage opportunities in the digital era to improve their business performance and sustainability?.

The inclusion criteria for this study included: publications in international and national journals; research focusing on the challenges and opportunities of MSMEs in the digital era; research published from 2010 to the present; research using both quantitative and qualitative data; case studies of MSMEs in various countries; and research comparing MSME performance before and after implementing digital technology.

The exclusion criteria applied to this study included: publications in the form of books or reports; research that did not address the challenges and opportunities of MSMEs in the digital era; research that only addressed technical aspects without discussing their impact on MSME performance; research published before 2010; research that was not accessible online; articles published in languages other than English and Indonesian; conference proceedings; and undergraduate theses. The data generated from this study will be analyzed qualitatively by synthesizing and summarizing findings from the selected literature. The results of the analysis will be categorized by theme and presented in narrative form.

RESULTS AND DISCUSSION

A comprehensive search was conducted following the search criteria as given in the search strategy. A total of 1000 research articles were selected. Following the search criteria, 320 articles were found eligible based on keywords, abstracts, and complete meta-data. These 320 articles were further screened based on their suitability to the research question, and finally, 58 articles were selected for the systematic review. The article sorting process is described in the following prism model:



The 58 articles were then selected based on their abstracts before being analyzed bibliometrically using VOSviewer software (version 1.6.13), specifically designed for bibliometric mapping (Perianes-Rodriguez et al., 2016). The first analysis applied using VOS viewer was to combine all bibliographic documents and then create a map based on the previously collected bibliographic data in RIS format. To improve the quality of SLR research results, the collection of articles certainly needs to be further screened to ensure the quality of the articles analyzed and recommended (Amjad et al., 2020).

Due to the increasing interest in the digitalization and MSME domains, as evidenced by several studies, this study only applies the criterion of grouping documents with a minimum of two citations. The goal was to strengthen the insights revealed by the bibliographic document analysis, namely to identify the most important trends on the topic of digitalization and MSMEs, a keyword co-occurrence analysis was conducted. The following is the resulting mapping based on the RIS collection with the topic of the MSME economy in the digital era.



Digitalization, the process of using digital technology to transform human activities, has created both opportunities and challenges in various areas of human life. Several international journals have published articles exploring the opportunities and challenges of digitalization.

One of the most significant challenges is the digital divide, which refers to the uneven distribution of digital technology and skills across populations and regions. This can create social, economic, and political inequalities that limit the benefits of digitalization for certain groups.

With the numerous changes brought about by the digital environment, MSMEs are faced with new challenges and opportunities on the international stage. The COVID-19

pandemic has further exacerbated the situation, forcing MSMEs to find survival strategies aided by expanded public policy prerogatives. This shock has left MSMEs in a state of existential crisis (Mura, L, 2017). Inadequate financing, a lack of social infrastructure, managerial skills, and sudden shocks caused by economic and tax reforms are issues that significantly impact the performance of small businesses at various levels of their operations (Idah, Y. M., & Pinilih, M. 2020). MSMEs also face challenges in shaping their behavioral intentions in the food sector when utilizing digital applications. These three dimensions explain changes in consumer consumption patterns (coercive), business competition (mimetic), and the business environment (Harianto, R.A., & Sari, P.N. (2021).

Finally, digitalization also creates challenges in terms of data privacy and security. As more data is collected and analyzed, there is a risk of data breaches, cyberattacks, and surveillance. This has led to new regulatory frameworks and ethical considerations surrounding the use of digital technology.

Opportunities Available to MSMEs in the Digital Era

Beyond these challenges, digitalization also creates several opportunities. One of the most significant opportunities for digitalization is the ability to collect and analyze large amounts of data. Davenport (2014) argues that big data can be used to improve decision-making, customer service, and operational efficiency. This has led to the development of data-driven business models that rely on analytics and machine learning to generate insights and predictions (Hazen et al., 2016).

Digital technology can enhance connectivity and information sharing within and outside MSMEs and catalyze user engagement in product innovation (Chavez et al., 2017). Digital technology can also influence the relationship between supply chain partners and customers, for example by involving users and suppliers in product design through digital platforms (Holmström et al., 2017).

Another opportunity for digitalization is the ability to leverage digital platforms and networks for mass collaboration and open innovation. Tapscott and Williams (2010) describe how wkinomics has enabled mass collaboration and cross-border co-creation, while West and Lakhani (2018) examine the role of expertise diversity and task autonomy in driving crowd performance.

Digitalization has also facilitated the emergence of smart and connected products that can communicate and exchange data with other devices and systems. Porter and Heppelmann (2014) argue that this has created new opportunities for product innovation, customer engagement, and service delivery. However, it also presents challenges in terms of data privacy, security, and interoperability.

Digitalization supports the development and acquisition of new skills, competencies, and knowledge, which in turn can lead to new products and processes (Nambisan et al., 2020). Furthermore, absorptive capacity, an integral element of the MSME innovation process, is highly dependent on access to internal and external knowledge. Therefore, if digitalization improves access to existing knowledge or provides new knowledge (Agostini et al., 2020), through, for example, big data analytics, it depletes MSMEs' absorptive capacity and, consequently, increases the likelihood of new products and processes.

By adopting digital technologies, MSMEs can develop unique resources that can increase productivity and efficiency, thus providing a competitive advantage over their competitors (Saleem et al., 2020). Furthermore, digital transformation can entail the

acquisition of new skills, competencies, and knowledge that can stimulate MSMEs to introduce new products and processes. Digitalization can also facilitate easier and faster communication between MSMEs when accessing external knowledge sources (Ardito et al., 2021).

Digitalization has had a significant impact on the entrepreneurial landscape, with many businesses now operating online and leveraging technology to streamline their operations. From e-commerce platforms to social media marketing, digital tools have enabled entrepreneurs to reach a wider audience and operate more efficiently.

Overall, the results of theoretical studies on digitalization in the context of entrepreneurship can provide insights into how digital technology is changing the entrepreneurial landscape and the strategies entrepreneurs can employ to successfully navigate these changes.

Utilizing Digitalization to Improve Business Performance and Sustainability in MSMEs

Industry 4.0 can offer tremendous opportunities for the creation of new products and services, better ways to serve customers, increased integration across and along the value chain, and the implementation of innovative business models (Müller et al., 2018). Digital transformation is changing the way MSMEs create and capture value (Bharadwaj et al., 2013; Lucas et al., 2013).

The digital era opens up significant opportunities for MSMEs to improve business sustainability. In today's digital era, MSMEs can utilize social media, marketplaces, or websites to market their products. This expands market reach and increases engagement with consumers (Liao, Y., Li, Y., & Huang, H. (2021). Furthermore, the digital era also makes it easier for MSMEs to maintain bookkeeping and manage finances, with applications or software that can assist MSMEs in this regard (Kaur, J., & Soin, P. (2021). MSMEs can also utilize technology to increase production efficiency, such as the use of machines or software that speed up the production process. By taking advantage of the opportunities available in the digital era, MSMEs can also enhance their skills and knowledge through online e-learning platforms.

MSMEs use and strive to adopt new digital technologies for various innovation-related purposes at various stages of their innovation process. It is important to assess the opportunities, threats, risks, and implications of using digital technologies, not only for MSMEs but also for society as a whole. Understanding how MSMEs need to organize themselves to maximize the benefits of these technologies is crucial (Raguseo, E, 2016). Only effective digital transformation will enable MSMEs to increase their competitiveness in the global market. Digital innovation technologies are linked to supporting knowledge management processes. These tools have significant potential to streamline internal and external knowledge sharing and facilitate knowledge dissemination among MSME employees (Gastaldi, L, 2019). Business models are also closely linked to digitalization. MSMEs must continuously change and improve their business models to compete with competitors or to gain a long-term competitive advantage. "Innovation," therefore, does not only apply to processes or products. This also applies to business model innovation and all areas of MSMEs in general.

Digitalization is a crucial factor in optimizing and improving business models. Digitalization, within business models, helps MSMEs maximize their profits and returns

(Westerman, 2011). Digital technology is a crucial factor in achieving the Green Deal's sustainability goals across various sectors.

Digital transformation is costly and time-consuming for MSMEs (Jacqueline, O., & Verdin, R. (2021)). Therefore, MSMEs need to clearly identify which areas of digital transformation are their priorities in their digital strategy. One key area of digital transformation is threat and opportunity management. Based on trends that represent new opportunities or threats to them, businesses are forced to embrace change and implement new innovative solutions related to digital transformation. This is not just about introducing new software and hardware solutions, but also about innovation processes, methodologies, and business models aimed at sustainable products and services for customers (Sebastian, 2017). The focus of MSMEs on innovation will enable these MSMEs to improve their market position and to increase or maintain their competitive advantage (Vidmar, D., Marolt, M., & Pucihar, A. 2021). The proposed concept for managing threats and opportunities in digital transformation will enable MSMEs to better identify and manage changes related to green and digital transformation.

CONCLUSION

Digitalization impacts nearly every aspect of our lives, and MSMEs must address the opportunities and threats associated with it (Straková, J. (2021), Korauš, A., (2021)). The opportunities and threats associated with digital transformation can have both positive and negative impacts on a sustainable world (Mihalčová, B., 2021). In light of these aspects, the findings of this study propose a concept for managing the opportunities and threats associated with digital transformation. Micro, small, and medium enterprises (MSMEs) face challenges and opportunities in the digital era. On the one hand, the rise of e-commerce and online marketplaces has created new channels for MSMEs to reach customers and grow their businesses. The increased use of digital technology has also enabled MSMEs to automate processes, streamline operations, and increase efficiency. However, the digital era also poses several challenges for MSMEs. Many MSMEs struggle to keep up with the rapidly changing technological landscape and may lack the skills and resources needed to adopt and integrate digital technologies into their operations. Furthermore, the increasing competition brought about by the digital market requires MSMEs to continuously innovate and differentiate themselves to remain competitive. Overall, the opportunities and challenges of digitalization are complex and diverse. By understanding these opportunities and challenges, policymakers, businesses, and individuals can develop strategies to effectively leverage digital technologies while addressing the associated risks and challenges. Overall, while the digital era presents both challenges and opportunities for MSMEs, it is clear that those who are able to embrace and leverage digital technologies will be better positioned to thrive in the modern business environment. MSMEs that can adapt to the new digital landscape, stay ahead of technological trends, and provide value to their customers through innovative products and services will be more likely to succeed in the long term.

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