

Bibliometric Analysis of the Adaptive Strategies of SMEs in the E-Commerce Era

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Abstract

The rapid development of digital technology and online marketplaces has transformed the business landscape, compelling small and medium-sized enterprises (SMEs) to adopt adaptive strategies to remain competitive. This study conducts a bibliometric analysis to map the scientific evolution, research trends, and thematic focus related to SMEs' adaptive strategies in the e-commerce era. Using data extracted from Scopus and Web of Science, the analysis applies performance analysis and science mapping techniques with tools such as VOSviewer and Bibliometrix. Results indicate significant growth in publications since 2015, with research themes dominated by digital transformation, technological adoption, online marketing, innovation capability, and organizational resilience. Cluster mapping reveals four major thematic groups: (1) digital adoption and technology readiness, (2) e-commerce competitiveness and marketing innovation, (3) supply chain agility and operational adaptation, and (4) SME resilience and sustainability. The study highlights increasing interest in integrating digital platforms, enhancing customer engagement, and leveraging data-driven decision-making. These findings provide a comprehensive overview of the intellectual structure and emerging research directions, offering valuable insights for researchers, policymakers, and practitioners in strengthening SMEs' adaptability in the e-commerce environment.

Keywords: SMEs; Adaptive Strategies; E-Commerce; Digital Transformation; Technology Adoption; Innovation Capability

1. Introduction

Micro, small, and medium companies (MSMEs) constitute over 60% of GDP and employ a substantial segment of the national workforce, serving as a cornerstone of the Indonesian economy. MSMEs must design adaptable strategies to endure and compete in a progressively competitive market influenced by globalization, the Fourth Industrial Revolution, and rapid digital transformation. The COVID-19 epidemic has heightened the significance of digitalization, leading numerous MSMEs to adopt e-commerce platforms for marketing and distributing their products (Arie Bowo, 2023). E-commerce has various advantages, such as expanded market access, decreased operational expenses, enhanced competitiveness via digital marketing, logistical integration, and streamlined transactions (Marni et al., 2025). Nonetheless, considerable obstacles persist, such as insufficient digital literacy, inadequate finances, and a limited comprehension of technology-driven marketing tactics (Arjuna et al., 2022). An adaptive strategy for MSMEs necessitates enhanced human resource capability, the development of business models, and governmental policy assistance.



Research on adaptable methods for MSMEs in the e-commerce era is progressively advancing in academic circles. Nonetheless, these studies continue to be undertaken across several domains, including management, marketing, digital economics, and public policy. A bibliometric analysis is required to elucidate research trends, author partnerships, predominant keywords, and the trajectory of scientific advancement concerning adaptable methods for MSMEs. This analysis is crucial for offering a thorough overview of the literature and serves as a foundation for developing a more targeted research and policy agenda. Therefore, the purpose of this article is to bibliometrically analyze scientific publications on adaptive MSME strategies in the e-commerce era. The results of this analysis are expected to help understand the knowledge landscape, identify research gaps, and offer strategic suggestions for developing MSMEs in the digital era.

2. Literature Review

Micro, Small, and Medium Enterprises (MSMEs) are essential to Indonesia's economy, significantly contributing to Gross Domestic Product (GDP) and employment generation. According to data from the Ministry of Cooperatives and SMEs, MSMEs account for over 60% of the national GDP and employ around 97% of the labor force (Kementerian Koperasi dan UKM, 2024). Nevertheless, the evolution of the digital age necessitates that MSMEs adapt to sustain competitiveness. This transition is mostly achieved through the application of digital technology and e-commerce platforms, which allow MSMEs to broaden market access, lower operating expenses, and enhance corporate efficiency (Marni et al., 2025). E-commerce functions as a transactional platform while simultaneously providing MSMEs the opportunity to establish brands, acquire consumer data, and incorporate logistics and digital payment systems (Sari, 2025).

In such circumstances, a flexible strategy is essential for SMEs to adjust to alterations in a dynamic business environment. This adaptable strategy encompasses digital marketing via social media, SEO, innovative content, and digital advertising (Putra, 2024); product innovation and branding to strengthen business identity (Wulandari, 2023); and collaboration within SME clusters to enhance productivity and competitiveness (Sari, 2025). Furthermore, to improve operational efficiency, technology-driven management solutions, including accounting software, inventory systems, and customer relationship management (CRM), are essential (Kementerian Koperasi dan UKM, 2024).

Nonetheless, other problems persist, including inadequate digital literacy, constrained finance, and intensifying competitiveness (Putra, 2024; Hidayat, 2023). Numerous MSME participants continue to struggle with comprehending digital technologies and efficiently utilizing e-commerce functionalities, necessitating training and mentorship (Marni et al., 2025). Consequently, assistance from the government, financial entities, and educational organizations is crucial for delivering training, mentorship, and favorable policies (Kementerian Koperasi dan UKM, 2024).

In academia, bibliometric analysis is utilized to chart the evolution of literature about adaptive solutions for SMEs in the e-commerce epoch. This approach can discern research patterns, author partnerships, predominant keywords, and the trajectory of theoretical and practical advancements. Bibliometric analysis offers a thorough overview of literature evolution and reveals research gaps that enhance academic comprehension while providing practical recommendations for the advancement of SMEs in the digital age (Marni et al., 2025; Sari et al., 2025).

Research on adaptation strategies for SMEs in the e-commerce era indicates that digitalization is a crucial element in improving competitiveness and ensuring economic sustainability. Several studies underscore the significance of e-commerce training in empowering SMEs, highlighting enhancements in digital literacy, expanded market access, and operational efficiency as primary advantages, despite persistent problems such as limited resources and data security (Putra, 2024). Other research employing a quantitative methodology illustrates that e-commerce utilization positively and significantly influences MSME sales performance, accounting for 42% of the variation in sales outcomes, thereby affirming that effective use of digital elements such as product catalogs, online payments, and social media advertising correlates with increased revenue and customer satisfaction (Hidayat, 2023). Conversely, Rahmawati (2024) emphasized the adaptation methods of MSMEs in response to the digital era, including business digitization, online presence development, data analytics, and product–service innovation. The study highlights that the success of digitalization strategies is significantly influenced by MSMEs' capacity to define business goals, allocate resources, and conduct continuous evaluation. Overall, the current literature indicates that the adaptive strategies of SMEs in the e-commerce age are associated not only with technology adoption but also with human resource readiness, government support, and stakeholder collaboration. Therefore, a bibliometric examination of this theme can map research trends, identify research gaps, and provide strategic guidance for strengthening SMEs in the digital era.

3. Methods

This study employed a bibliometric approach to map the intellectual structure and research development related to adaptive strategies of SMEs in the e-commerce era. Data were extracted from Scopus and Web of Science (WoS), as these databases provide comprehensive and high-quality scientific publications. The search strategy used a combination of keywords such as “SMEs,” “adaptive strategies,” “e-commerce,” “digital transformation,” “technology adoption,” and “online business.” Inclusion criteria required that publications be written in English, indexed in Scopus or WoS, and published between 2010–2024. Document types included articles, conference papers, reviews, and book chapters. After filtering, a total of 412 publications met the criteria. The analysis was conducted using Bibliometrix (R-package) for performance indicators and VOSviewer for visualization of co-authorship networks, keyword co-occurrence, and citation patterns. Performance analysis evaluated publication trends, productive authors, influential journals, and citation metrics. Science mapping, through network visualization, identified research clusters that represent thematic structures and conceptual linkages among studies. All bibliometric outputs were interpreted qualitatively to understand the evolution of the field and emerging directions in SME adaptive strategies research.

The red cluster on the left represents studies focusing on e-commerce adoption, highlighting keywords such as factors, performance, influence, adoption, and adoption. This cluster suggests that a significant portion of the literature concentrates on identifying factors that influence digital adoption and its impact on SME performance. The presence of terms like sample, respondent, questionnaire, and hypothesis test shows that many studies employ quantitative approaches to examine these relationships.

The blue cluster at the top contains keywords such as product, training, capacity, evaluation, Indonesia, and medium enterprises. This cluster reflects research related to capacity building, digital training, product innovation, and skill development for SMEs. The emphasis on training and evaluation indicates that scholars acknowledge the importance of digital literacy enhancement, capability strengthening, and structured intervention programs to prepare SMEs for digital transformation. The green cluster at the bottom highlights terms such as framework, policymaker, logistics, value chain, opportunity, and intelligence. This cluster focuses on strategic frameworks, policymaking, supply chain innovation, and broader ecosystem support for SMEs. Research in this segment often discusses how SMEs can leverage logistical improvements, digital infrastructure, and technology-driven frameworks to enhance competitiveness while benefiting from government policies and integrated value chains.

On the right side, the yellow-green cluster includes keywords such as opportunity, network, business model, community, and promotion. This cluster represents research that explores digital business models, networking, community-based marketing, and opportunities arising from digital platforms. It emphasizes the role of collaboration, digital communities, and online promotional strategies in expanding market reach and strengthening SME resilience. Overall, the bibliometric map shows that research on SMEs in the e-commerce era is multidimensional, interconnected, and rapidly evolving. The strong linkages between clusters demonstrate that effective SME adaptation requires a combination of digital adoption, capacity building, strategic frameworks, and network-based innovation. This visualization confirms the interdisciplinary nature of SME digital transformation research, integrating perspectives from technology, management, policy, marketing, and organizational development.

5. Conclusion

The bibliometric analysis reveals that research on adaptive strategies of SMEs in the e-commerce era has grown significantly over the past decade. The topic has attracted global scholarly attention, particularly after the COVID-19 pandemic, which accelerated digital transformation and forced SMEs to adopt new business strategies. The analysis shows four major thematic clusters: digital adoption, marketing innovation, supply chain adaptation, and organizational resilience. These themes highlight the complex and multidimensional nature of SME adaptation, involving both technological and strategic business changes. Overall, the study provides a comprehensive overview of research patterns, key contributors, and emerging trends. It underscores the importance of integrating technology, innovation capability, and resilience-building efforts to enhance SME performance and competitiveness in an increasingly digital marketplace. The insights gained from this bibliometric mapping can guide future research, inform policy development, and support practitioners in designing more effective adaptive strategies in the evolving e-commerce landscape.

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