

Strengthening MSME Adaptation Strategies through the Integration of Digital Marketing, Creative Innovation, and Technological Capabilities in Facing Business Environment Uncertainty

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Abstract. This study aims to analyze the strengthening of adaptation strategies for Micro, Small, and Medium Enterprises (MSMEs) through the integration of digital marketing, creative innovation, and technological capabilities in responding to business environment uncertainty. The study employs a qualitative approach using a literature review method, where data were obtained from various scientific publications and credible sources through searches on Google Scholar and official websites of relevant institutions within the period of 1991–2026. From an initial pool of 50 articles, a rigorous selection process was conducted based on relevance, quality, and contribution to the research topic, resulting in 27 articles for further analysis using descriptive analysis techniques. The findings indicate that the integration of digital marketing enables expanded market access and improved customer interaction, while creative innovation plays a role in generating product differentiation and business flexibility. Technological capabilities are also proven to enhance operational efficiency and MSME readiness in facing change. However, the implementation of these three aspects still encounters various challenges, such as low digital literacy, limited access to technology, and suboptimal policy support. Therefore, integrated efforts are required through strengthening human resource capacity, providing access to technology and financing, and fostering collaboration among stakeholders to sustainably enhance MSME resilience and competitiveness.

Keywords: MSMEs, Adaptation Strategy, Digital Marketing, Creative Innovation, Technological Capability, Business Resilience.

1. Introduction

The increasingly dynamic and uncertain business environment has compelled business actors, particularly Micro, Small, and Medium Enterprises (MSMEs), to adapt quickly and strategically. This uncertainty is driven by various factors such as technological disruption, changes in consumer behavior, and intensifying global competition [1]. In this context, MSMEs can no longer rely on conventional business patterns but must develop adaptation strategies based on the utilization of technology and innovation. Strengthening adaptation strategies has become a crucial issue that requires in-depth examination to ensure the sustainability and competitiveness of MSMEs amid unpredictable changes.

One increasingly relevant approach to supporting MSME adaptation is the integration of digital marketing into business activities. Digital marketing functions as a tool to better understand consumer behavior through data and analytics. By leveraging digital platforms, MSMEs can expand their market reach beyond geographical limitations and enhance customer interaction more effectively [2]. However, not all MSMEs possess adequate capabilities to optimize digital marketing, highlighting the need for integrated and sustainable strategies.

In addition to digital marketing, creative innovation is also an important factor in enhancing MSME adaptability. Creative innovation includes the development of products, business models, and marketing strategies that provide added value and differentiation in the market [3]. In uncertain situations, MSMEs that are

capable of innovation tend to be more flexible in responding to changes and creating new opportunities. Innovation is therefore seen as a strategic necessity that must continuously be developed by MSME actors.

Technological capability also plays a critical role in supporting the success of MSME adaptation strategies. This capability includes the ability to access, manage, and effectively utilize technology to improve operational efficiency and service quality. MSMEs with strong technological capabilities are generally better prepared to face changes in the business environment, as they are able to integrate various digital systems into their business processes [4]. However, resource limitations often become the main barrier to developing these capabilities.

The integration of digital marketing, creative innovation, and technological capability is a key factor in building strong adaptation strategies for MSMEs. These three aspects complement each other and form a business ecosystem that is adaptive and responsive to change. Without proper integration, MSME efforts tend to be partial and less effective in addressing complex challenges [5]. A holistic approach is therefore required to synergistically combine these elements.

In the literature, several previous studies indicate that MSMEs' ability to adopt digital technology and develop innovation significantly contributes to improving business resilience, particularly during times of crisis. Research conducted by [6] confirms that MSMEs utilizing digital technology are more capable of withstanding economic shocks due to their operational flexibility and broader market access. This finding is reinforced by a report [1] stating that digital transformation is a key factor in sustaining MSMEs, especially amid disruptions caused by the pandemic.

Empirical research by [7] shows that the use of digital marketing and e-commerce platforms enhances MSME resilience by enabling them to continue reaching consumers despite restrictions on physical activities. Meanwhile, a study by [8] finds that product and business model innovation plays an important role in helping MSMEs adapt to rapid and unpredictable market demand changes. However, practical implementation still faces several challenges, such as low digital literacy, limited access to technology, and insufficient policy support, particularly among MSMEs in developing countries [6].

Furthermore, business environment uncertainty requires MSMEs to possess the ability to manage risks and make strategic decisions. In this regard, the integration of digital marketing, creative innovation, and technological capability can serve as an effective tool to reduce uncertainty and enhance business resilience. By utilizing data and technology, MSMEs can make more accurate and informed decisions, enabling them to survive and grow in unstable conditions [9].

Based on the above discussion, this study is important to conduct in order to comprehensively examine how MSME adaptation strategies can be strengthened through the integration of digital marketing, creative innovation, and technological capabilities. This study is expected to provide theoretical contributions to the development of literature related to MSME adaptation strategies, as well as practical contributions for business actors and policymakers in formulating effective and sustainable strategies. Ultimately, MSMEs are expected to enhance their competitiveness and resilience in facing business environment uncertainty.

1.1. MSMEs

MSMEs are productive business entities operated by individuals or organizations on a small to medium scale, playing a vital role in the economy, particularly in job creation and income distribution [10], [11], [12]. MSMEs are generally characterized by limited resources in terms of capital, technology, and managerial capacity, yet they exhibit high flexibility in adapting to market changes. In the modern economic context, MSMEs are viewed as strategic actors with strong growth potential through the utilization of technology and innovation.

1.2. Adaptation Strategy

An adaptation strategy refers to a set of efforts undertaken by organizations or business actors to adjust to dynamic and uncertain business environments [13]. This strategy involves the ability to identify opportunities and threats and respond through changes in business models, operational processes, and marketing approaches. In the context of MSMEs, adaptation strategies are crucial as they determine the ability of businesses to survive and grow amid external pressures such as technological disruption, shifting consumer behavior, and market competition.

1.3. Digital Marketing

Digital marketing refers to marketing activities that utilize digital technologies and online platforms to promote products or services and build relationships with consumers [14]. It includes the use of social media, marketplaces, websites, and data-driven digital advertising. For MSMEs, digital marketing provides opportunities to reach broader markets at relatively low cost while enabling more personalized interactions with

customers. Additionally, the use of data in digital marketing helps business actors better understand consumer behavior and improve the effectiveness of marketing strategies.

1.4. Creative Innovation

Creative innovation is the process of developing new ideas that generate added value, whether in the form of products, services, or business models [15]. This innovation does not always have to be radical but can involve improvements or modifications relevant to market needs. In the MSME context, creative innovation is key to creating differentiation and enhancing product attractiveness in highly competitive markets. The ability to continuously innovate allows MSMEs to be more responsive to changing trends and consumer preferences.

1.5 Technological Capability

Technological capability refers to an organization's ability to access, adopt, manage, and effectively utilize technology to support business activities [16]. This capability encompasses human resource skills, technological infrastructure, and the ability to integrate technology into operational processes and business strategies. For MSMEs, technological capability is a critical factor in improving efficiency, productivity, and competitiveness, especially in the digital era that demands speed and accuracy in decision-making.

1.6 Business Resilience

Business resilience is the ability of a business to survive, adapt, and even grow under conditions of pressure or uncertainty [17]. This resilience includes preparedness in anticipating changes and leveraging emerging opportunities. In the MSME context, business resilience is influenced by various factors such as operational flexibility, innovation capability, and the use of technology. MSMEs with high levels of resilience are more likely to sustain their operations in the long term.

2. Method

The research method used in this study is a literature review with a qualitative approach. This approach was chosen because the study aims to gain an in-depth understanding of concepts, findings, and developments related to MSME adaptation strategies through the integration of digital marketing, creative innovation, and technological capabilities in facing business environment uncertainty. The analysis is conducted descriptively by explaining, comparing, and synthesizing findings from previous studies to obtain a comprehensive and integrated understanding. The data sources in this study consist of secondary data obtained from various scientific publications and credible online sources. Data collection was conducted through searches on Google Scholar and official websites of relevant and reputable institutions. The publication period ranges from 1991 to 2026 to ensure that the analyzed data reflects both recent developments and strong theoretical foundations. The data collection process was carried out using relevant keywords such as "MSMEs," "digital marketing," "innovation," "technological capability," and "business resilience." In the initial stage, 50 articles relevant to the research topic were identified. Subsequently, a rigorous selection process was conducted based on inclusion and exclusion criteria, including topic relevance, publication quality, methodological appropriateness, and contribution to the research focus. After this screening process, 27 articles were selected as the most relevant and used as the basis for analysis in this study. The data analysis technique employed is descriptive qualitative analysis, which involves categorizing, interpreting, and drawing conclusions from the findings in the selected literature. This process includes identifying key themes, comparing research results, and determining patterns of relationships among the studied variables. Thus, this method is expected to provide a systematic and in-depth understanding of MSME adaptation strategies in responding to the dynamics and uncertainty of the business environment.

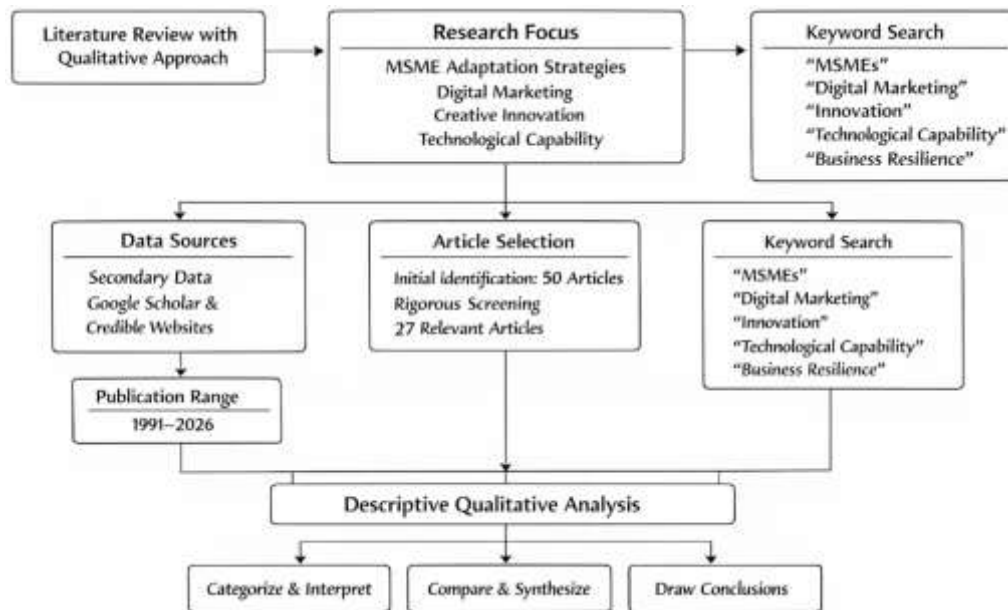


Figure 1. Research Methodology Flowchart

3. Result and Discussion

The discussion on strengthening MSME adaptation strategies cannot be separated from theoretical frameworks that explain how organizations systematically and sustainably respond to environmental changes. One of the most relevant theories is Dynamic Capabilities Theory introduced by [18], which emphasizes that organizational advantage is determined by the ability to integrate, build, and reconfigure resources dynamically in response to rapid change. In the MSME context, these dynamic capabilities are reflected in the ability of business actors to perform sensing (detecting market changes through digital data), seizing (capturing opportunities through digital marketing strategies), and transforming (modifying business models through innovation and technology adoption). Adaptation strategies are no longer understood merely as reactive responses to external pressures, but as proactive and continuous processes aimed at achieving strategic alignment between internal resources and the evolving business environment.

In addition, the Resource-Based View (RBV) provides a complementary perspective that strengthens the understanding of the importance of internal resources in building MSME competitive advantage. This theory, popularized by [19], highlights that resources characterized as valuable, rare, inimitable, and non-substitutable (VRIN) are the key determinants of long-term organizational success. Within this framework, digital marketing is viewed as a data-driven strategic asset; creative innovation as a differentiation capability that is difficult to imitate; and technological capability as an operational foundation that enhances efficiency and flexibility. The integration of these three aspects creates a strategic bundle of resources that strengthens MSMEs' competitive position. Adaptation, therefore, depends not only on external pressures but also on the internal ability to manage, combine, and exploit resources effectively to generate sustainable value amid uncertainty.

From an empirical perspective, various previous studies consistently demonstrate that the integration of digital technology significantly contributes to enhancing MSME resilience during crises. A report by [20] confirms that MSMEs adopting digital technologies exhibit higher levels of operational flexibility, particularly in adjusting business processes and reaching new markets during periods of economic disruption. This finding is supported by [21], which states that digitalization enables MSMEs to maintain business activities through online channels, thereby reducing dependence on physical interactions. Theoretically, this indicates that technology acts as an enabler of resilience, allowing organizations to adapt more quickly. Technology has thus evolved into a fundamental pillar in building robust and sustainable adaptation strategies.

Furthermore, empirical research by [14] shows that effective implementation of digital marketing improves the quality of customer interaction through two-way communication and expands market reach beyond geographical boundaries. Meanwhile, a study by [22] emphasizes that product and business model innovation plays a central role in ensuring business continuity, especially in responding to increasingly dynamic consumer preferences. A deeper analysis of these findings leads to the concept of the complementarity effect, where the

combination of digital technology and creative innovation produces greater impact than partial implementation. This integration enables MSMEs to create unique value that is difficult for competitors to replicate. The synergy between digital marketing and innovation thus becomes a key element in building long-term competitive adaptation strategies.

The digital transformation of culinary MSMEs in Indonesia, particularly in cities such as Jakarta, Bandung, and Surabaya during the COVID-19 pandemic, provides a concrete illustration of how technology-based adaptation strategies operate in practice [1]. Many business actors who previously relied on offline sales through physical outlets were forced to undertake business model pivoting by shifting to digital platforms such as marketplaces, delivery applications, and social media. From the perspective of Dynamic Capabilities [18], this shift reflects sensing changes in consumer behavior, seizing opportunities through digital channels, and transforming operational systems, such as implementing pre-order and app-based delivery systems. The results indicate that despite reduced physical mobility, MSMEs were able to maintain and even increase sales through improved distribution efficiency and expanded digital market reach. Conceptually, this case demonstrates that digital marketing has evolved from being merely an alternative to becoming a core strategy in sustaining business continuity, while also showing that technology adoption enhances business resilience under extreme crisis conditions.

Local fashion MSMEs in Bandung, one of Indonesia's creative industry hubs, demonstrate how creative innovation can serve as a source of adaptive advantage in responding to highly dynamic market trends [23]. Business actors who are able to integrate design creativity with digital data utilization, such as social media trend analysis and consumer preference insights, tend to have higher resilience compared to those relying on conventional approaches. Strategies such as limited-edition production and storytelling marketing help build emotional connections with consumers. From the Resource-Based View perspective [19], this form of creative innovation can be categorized as inimitable and non-substitutable resources, as it is rooted in unique creativity and brand identity. Innovation thus functions as a strategic mechanism for building customer loyalty and maintaining competitive positioning in the highly competitive fashion industry.

Handicraft MSMEs in Bali provide a tangible example of how the integration of technological capabilities can enhance competitiveness in global markets [24]. Business actors who adopt technologies such as digital-based design (e.g., simple CAD) and utilize international e-commerce platforms are able to expand their market reach to overseas consumers. Within the Dynamic Capabilities framework [18], this reflects the ability to reconfigure production and marketing processes from a local to a global scale. However, such success does not occur instantly but requires continuous technological learning and investment in human resource capacity development. Analytically, this case shows that technological capability is closely linked to an organization's ability to internalize digital knowledge as part of its long-term strategy. Technology integration thus becomes a key factor in transforming MSMEs from local enterprises into competitive global players.

Despite the significant benefits demonstrated by technology-based adaptation strategies, their implementation still faces complex structural challenges, one of which is the low level of digital literacy among MSME actors. Digital literacy encompasses a strategic understanding of how technology can be utilized to create business value. Many MSMEs remain at the basic usage stage, such as merely posting products on social media, without understanding advanced concepts like data analytics, customer segmentation, and conversion optimization. From a theoretical perspective, this condition reflects a gap in absorptive capacity, which refers to an organization's ability to recognize, assimilate, and utilize new knowledge [25]. As a result, the potential of digital transformation to improve MSME performance and competitiveness remains underutilized, thereby hindering more strategic and sustainable adaptation processes.

Another critical issue is the limited access to technology and supporting infrastructure, which directly affects MSMEs' ability to effectively implement digital strategies. In many regions, particularly semi-urban and rural areas in Indonesia, unstable internet access and limited technological devices pose major obstacles to digital business operations. Additionally, limited financial resources restrict MSMEs' ability to invest in advanced technologies such as customer relationship management (CRM) systems or digital analytics tools. From the Resource-Based View perspective [19], this condition indicates that not all MSMEs have access to the strategic resources required to build competitive advantage. This creates a gap between digitally enabled MSMEs and those that are lagging behind, thereby widening disparities in adaptive capacity. These challenges are not only technical but also structural and systemic in nature.

From a policy perspective, uneven and poorly integrated government support also acts as a barrier to strengthening MSME adaptation strategies. Although various digitalization programs have been introduced, their implementation often faces issues such as misalignment of targets, lack of inter-agency coordination, and insufficient continuous support. Many programs take the form of one-shot interventions, such as short-term training without follow-up, which fail to create significant behavioral change among MSME actors. From the

innovation ecosystem perspective, the success of digital transformation depends on systemic support involving government, the private sector, and academic institutions [26]. The lack of synchronization within this ecosystem results in fragmented and suboptimal adaptation strategies. Therefore, a more holistic, integrated, and long-term policy approach is needed to create a conducive environment for developing adaptive and competitive MSMEs.

Enhancing digital literacy through continuous training and mentoring is a transformational step in building MSME adaptive capacity. In this context, digital literacy should be understood as a multidimensional capability encompassing operational skills, analytical understanding, and strategic ability to leverage technology for value creation. Effective training programs should go beyond introducing digital platforms and include advanced aspects such as data analytics, customer journey mapping, and digital engagement strategies. From the Dynamic Capabilities perspective [18], such efforts strengthen sensing and seizing capabilities, enabling MSME actors to better interpret market trends and respond appropriately. Continuous mentoring is also essential to ensure that learning processes are not temporary but become embedded in daily business practices. Improving digital literacy thus reinforces the strategic foundation of MSMEs in dealing with increasingly complex business environments.

Strengthening access to technology and financing is a crucial structural prerequisite for supporting the implementation of digital-based adaptation strategies. Financial constraints, which have long been a major barrier for MSMEs, need to be addressed through innovative financing schemes such as fintech-based lending, digital adoption subsidies, and fiscal incentives for businesses undergoing digital transformation. From the Resource-Based View perspective [19], access to technology and capital can be seen as an effort to expand ownership of strategic resources previously inaccessible to many MSMEs. At the same time, equitable development of digital infrastructure, including stable and affordable internet networks, is an essential supporting factor. Without adequate infrastructure, technology adoption will remain partial and suboptimal. Synergy between financing policies and infrastructure development is therefore key to creating a level playing field for all MSMEs, minimizing the digital divide, and ensuring more inclusive access to adaptation opportunities.

Policy integration and cross-sector collaboration among government, industry, and academia are key elements in building an adaptive and sustainable MSME ecosystem. This approach aligns with the concept of the innovation ecosystem, which emphasizes the importance of interactions among actors in creating shared value through the exchange of knowledge, technology, and resources [27]. The government acts as a policy facilitator and regulator, the private sector as a provider of technology and market access, and academia as a source of innovation and capacity building. Structured collaboration enables the development of more targeted, sustainable, and needs-based programs for MSMEs. Moreover, cross-sector policy integration is crucial to avoid program fragmentation, which has been a major challenge in implementation. With strong synergy, MSME adaptation strategies can generate long-term impacts in enhancing overall economic competitiveness and resilience.

Overall, this discussion confirms that strengthening MSME adaptation strategies in the face of business environment uncertainty requires a holistic and integrated approach encompassing technology, innovation, resources, and ecosystem support. The integration of digital marketing, creative innovation, and technological capability has proven to be a fundamental foundation for building MSME resilience and competitiveness, both theoretically and empirically. However, challenges such as low digital literacy, limited access to technology, and suboptimal policy support indicate that the transformation process still faces significant obstacles. Therefore, implementing solutions that include enhancing human resource capacity, expanding access to technology and financing, and strengthening cross-sector collaboration is essential. With a comprehensive and sustainable approach, MSMEs are expected not only to survive but also to grow adaptively in navigating the dynamics and uncertainty of the future business environment.

Table 1. Strengthening MSME Adaptation Strategies in Uncertain Business Environments

No.	Aspect / Theme	Key Findings	Implications
1	Theoretical Foundation (Dynamic Capabilities)	MSME adaptation depends on sensing, seizing, and transforming capabilities in responding to rapid environmental changes.	Adaptation must be proactive, continuous, and strategically aligned with environmental dynamics.
2	Theoretical Foundation (RBV)	Competitive advantage is driven by internal resources that are valuable, rare, inimitable, and non-substitutable (VRIN).	MSMEs must optimize internal resources such as digital marketing, innovation, and technology.

3	Role of Digital Technology		Digital technology enhances operational flexibility and enables MSMEs to access broader markets during crises.	Technology acts as an enabler of resilience and accelerates adaptation processes.
4	Digital Marketing		Improves customer interaction and expands market reach beyond geographical limits.	Becomes a core strategy for sustaining business continuity and competitiveness.
5	Creative Innovation		Enables product differentiation and responsiveness to changing consumer preferences.	Strengthens competitive positioning and builds customer loyalty.
6	Complementarity Effect		Integration of digital marketing and innovation creates greater impact than separate implementation.	Synergy among strategies is essential for maximizing adaptation outcomes.
7	Empirical Case: Culinary MSMEs		Digital transformation during COVID-19 enabled business continuity through online platforms.	Business model pivoting is critical for survival in crisis situations.
8	Empirical Case: Fashion MSMEs		Creative innovation combined with digital insights increases resilience and market relevance.	Innovation becomes a strategic resource that is difficult to imitate.
9	Empirical Case: Handicraft MSMEs		Technological capability supports expansion into global markets.	Technology integration facilitates transformation from local to global business scale.
10	Digital Literacy Challenge		Low digital literacy limits MSMEs to basic technology use without strategic optimization.	Capacity building is needed to enhance absorptive capacity and technology utilization.
11	Technology Infrastructure Constraint	&	Limited access to digital infrastructure and tools hinders effective implementation.	Investment in infrastructure and technology access is essential.
12	Financial Constraint		Limited capital restricts MSMEs from adopting advanced technologies.	Innovative financing schemes are required to support digital transformation.
13	Policy Issues		Government support is often fragmented, short-term, and poorly coordinated.	Integrated and long-term policy frameworks are necessary.
14	Digital Literacy Improvement		Continuous training and mentoring enhance MSME adaptive capabilities.	Strengthens sensing and seizing capabilities in dynamic markets.
15	Access to Technology & Financing		Equitable access to technology and funding reduces digital divide among MSMEs.	Creates inclusive opportunities for adaptation and competitiveness.
16	Collaboration Ecosystem	&	Cross-sector collaboration (government, private sector, academia) is crucial.	Builds a sustainable innovation ecosystem for MSME development.
17	Overall Conclusion		Integration of digital marketing, innovation, and technology is key to MSME resilience and competitiveness.	Holistic and sustainable strategies are required for long-term adaptation.

4. Conclusion

Based on the discussion, it can be concluded that strengthening MSME adaptation strategies in facing business environment uncertainty is largely determined by the ability to integrate digital marketing, creative innovation, and technological capabilities. These three aspects function not merely as supporting tools but as fundamental pillars in building business resilience and competitiveness. MSMEs that are able to optimize the use of digital technology, develop innovations aligned with market needs, and enhance their technological capabilities have proven to be more adaptive to change and external pressures. Furthermore, theoretical approaches such as Dynamic Capabilities and the Resource-Based View reinforce that successful adaptation depends heavily on internal capabilities in managing and continuously developing strategic resources.

Theoretically, this study contributes to enriching the literature on MSME adaptation strategies by emphasizing the importance of integrating technology, innovation, and organizational capabilities. It also

reinforces the relevance of Dynamic Capabilities and the Resource-Based View in the context of MSMEs in the digital era. Practically, the findings provide implications for MSME actors to be more proactive in adopting digital technologies and fostering innovation as part of their long-term business strategies. For governments and stakeholders, this study highlights the importance of providing a supportive ecosystem, including digital training, access to financing, and integrated policies to encourage comprehensive MSME transformation.

This study has several limitations that should be acknowledged. First, it employs a literature review approach, making it dependent on the availability and quality of the analyzed sources without direct empirical testing in the field. Second, the data scope is limited to publications within the 1991–2026 period, which may exclude more recent studies. Third, the generalizability of the findings remains limited, as the study does not specifically examine differences in MSME characteristics based on industry sector, business scale, or geographical conditions that may influence varying levels of adaptability.

Based on these limitations, future research is recommended to adopt empirical approaches using quantitative or mixed methods to directly examine the relationship between digital marketing, creative innovation, and technological capability on MSME resilience. Further studies may also expand the scope by comparing different MSME sectors or geographic regions to obtain more comprehensive results. For MSME practitioners, it is recommended to enhance digital literacy and continuously innovate to better adapt to market changes. Meanwhile, for governments and policymakers, more integrated and sustainable efforts are needed to provide support in the form of training, digital infrastructure, and access to financing to strengthen an adaptive and competitive MSME ecosystem.

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