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Strategic IT Adoption in MSME'S: Overcoming Challenges and Seizing Opportunities

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ABSTRACT

Micro, Small, and Medium Enterprises (MSMEs) are crucial to economic growth, especially in emerging markets like Indonesia. However, these businesses often face challenges in adopting digital technologies to remain competitive. This study examines how digital marketing strategies, operational strategies, and technology adoption affect the ability of MSMEs in Makassar, Indonesia, to seize market opportunities. The research employs a quantitative approach using Structural Equation Modeling (SEM) and collects data from 391 MSMEs through structured surveys.

The findings reveal that digital marketing strategies significantly enhance technology adoption ($\beta = 0.328$, $p < 0.001$). Additionally, both digital marketing and operational strategies positively influence the ability to identify market opportunities ($\beta = 0.259$ and $\beta = 0.292$, respectively, $p < 0.001$). Furthermore, digital technology adoption directly impacts market opportunity identification ($\beta = 0.334$, $p < 0.001$). These results highlight that MSMEs with well-defined digital marketing strategies are more likely to adopt new technologies, which, in turn, helps them identify and seize market opportunities effectively.

This study contributes to the theory of digital transformation in MSMEs by demonstrating the significant role of digital strategies in improving market responsiveness and competitiveness. Practically, it suggests that MSME owners should prioritize integrating digital marketing, operational strategies, and technology adoption to enhance their business growth. However, the study's focus on Makassar limits its generalizability, and future research could explore additional factors such as government support or access to digital infrastructure. In conclusion, MSMEs can strengthen their market position by embracing digital strategies and technologies, ensuring long-term success and growth in an increasingly digital business landscape.

Keywords: Information Technology; MSMEs; Digitalization; Digital Marketing Strategy; Strategic Alignment.

INTRODUCTION

In the rapidly evolving digital era, technology has emerged as a fundamental driver of business transformation worldwide. Digitalization is not merely about adopting new technologies; it encompasses a comprehensive change in how companies interact with customers, manage internal processes, and create value. For Micro, Small, and Medium Enterprises (MSMEs), digitalization presents significant opportunities to enhance efficiency, expand market reach, and improve competitiveness. However, despite this vast potential, many MSMEs face challenges in adopting effective digital strategies. According to Rajagopal et al. (2023), a Result-Oriented Systems Thinking approach to digital transformation management can assist MSMEs in formulating better and more sustainable strategies.

While digitalization provides significant advantages, it does not automatically place MSMEs in a better competitive position. Large companies continue to dominate multiple technological areas, including e-booking and orders, business-to-government (B2G) interactions, enterprise resource planning (ERP), social media management, electronic invoicing, cloud computing, RFID, e-commerce, and big data analytics (OECD, 2021). MSMEs often face challenges in accessing

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and utilizing these technologies due to capital constraints, lack of technical expertise, and inadequate business network structures (Lutfi et al., 2022). Moreover, research indicates that the number of MSMEs adopting social media and digital tools remains relatively low due to these limitations (Tiwasing, 2021).

Nevertheless, MSMEs still have the potential to leverage digitalization and innovation to enhance their competitiveness. Two key areas where MSMEs can thrive despite technological barriers are e-commerce adoption and innovation capability. E-commerce enables MSMEs to expand their market reach, improve customer engagement, and increase revenue streams (Sanchez-Torres & Juarez-Acosta, 2019). Businesses that strategically implement e-commerce technologies can establish themselves as market leaders and improve operational efficiency (Yeng et al., 2016). Unlike capital-intensive technologies such as ERP and Business Intelligence (BI), e-commerce offers an accessible entry point for MSMEs to engage in digital transformation (Burgess, 2001; Perrino et al., 2017). Moreover, digital transformation extends beyond technology adoption—it requires strategic alignment within MSMEs to optimize resource utilization and ensure long-term growth (Rajagopal et al., 2023).

LITERATURE REVIEW

Literature suggests that digitalization significantly impacts the sustainability of MSMEs. Cueva-Vargas et al. (2024) highlight that innovation acts as a mediator between digitalization and sustainability performance, particularly in labor-intensive sectors such as manufacturing. Their study emphasizes that digital strategies enhance operational efficiency, sustainability, and competitiveness. Furthermore, Canhoto et al. (2021) propose a digital strategy alignment model that underscores the importance of dynamic capabilities—the ability of MSMEs to adapt and reorganize business processes in response to rapid market changes. This adaptability is crucial, given that smaller enterprises often lack the financial and human capital that larger corporations possess.

Despite the wealth of research on digitalization and MSMEs, several challenges persist. Many MSMEs lack the necessary knowledge and skills to effectively implement new technologies, while financial constraints further hinder investments in advanced digital tools (D'Aurizio et al., 2022). This highlights the need for a holistic approach that supports MSMEs in integrating digital transformation with business strategy, innovation, and sustainability.

Beyond technology adoption, innovation capability is another key determinant of MSME growth and sustainability (Saunila, 2020). It refers to an enterprise's ability to develop and implement novel ideas that enhance products, services, or processes (Enkel & Gassmann, 2010; West & Bogers, 2014; Naala et al., 2017). The Indonesian government has recognized innovation as a fundamental driver of MSME development, emphasizing its role in boosting competitiveness and resilience (Coordinating Ministry for the Economy, 2022). High innovation capability enables businesses to respond to market dynamics, improve efficiency, and create unique offerings.

There are five essential components of innovation capability: absorptive capacity and external knowledge, organizational structure and culture, leadership and communication, individual creativity and innovation skills, and an organizational learning culture (Simon, 1991; Konsti-Laakso et al., 2012; Salampasis & Mention, 2018). Studies indicate that MSMEs that develop these elements are more likely to create market-leading products, enhance competitiveness, and ensure long-term business sustainability (Dahlander & Gann, 2010; Heilmann et al., 2020; Samsir, 2018). While previous research has explored the relationship between innovation capability and MSME performance (Saunila, 2020), limited studies have integrated digitalization, innovation, and strategic planning within the MSME context.

Thus, this research aims to bridge this gap by investigating the effect of digitalization, innovation, and strategic planning on MSME performance, with technology adoption as a moderating factor. By examining these interrelationships, this study provides insights into how MSMEs can leverage digital transformation, innovation, and strategy to achieve sustainable growth and competitive advantages. Moreover, it seeks to contribute to policy recommendations and practical strategies that can help MSMEs navigate the challenges of digital transformation and maximize the opportunities presented by technological advancements.

Problem Statement

Despite the recognized benefits of digitalization for Micro, Small, and Medium Enterprises (MSMEs), many of these businesses struggle to implement effective digital strategies that enhance their ability to seize opportunities and remain

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competitive. The existing literature highlights several challenges, including limited financial resources, a lack of technical skills, and resistance to change, which hinder the adoption of digital technologies. Furthermore, there is a paucity of empirical studies that explore the intricate relationship between digitalization, innovation, and the capacity to seize opportunities within the MSME sector.

Consequently, this research seeks to address the following questions: How can MSMEs effectively integrate digital technologies to enhance their ability to seize opportunities? What role does innovation play in mediating the relationship between digitalization and the ability to capitalize on emerging trends? And finally, which strategies can MSMEs employ to overcome the barriers to digital transformation? By addressing these questions, this study aims to contribute to a deeper understanding of the pathways through which digitalization can be leveraged to foster growth and competitiveness in MSMEs.

Conceptual Framework

The conceptual framework for this research centers on the interaction between three key variables: Strategy, Seizing Opportunities, and Digital Technology.

Strategy serves as the independent variable and is further divided into two primary components: Digital Marketing Strategy and Operational Strategy. The Digital Marketing Strategy encompasses the tactics MSMEs employ to promote their offerings through digital channels, enhancing brand visibility and customer engagement. In contrast, the Operational Strategy focuses on optimizing internal processes through digital tools, improving efficiency and service delivery.

The dependent variable, Seizing Opportunities, reflects the ability of MSMEs to identify and act on market trends and emerging customer needs. This capability is directly influenced by the effectiveness of the strategies implemented.

Digital Technology functions as the moderating variable, affecting the strength of the relationship between strategy and seizing opportunities. The sophistication and availability of digital tools can enhance the positive impact of both Digital Marketing and Operational Strategies, enabling MSMEs to respond more effectively to market opportunities.

In summary, this framework illustrates that effective strategies in both marketing and operations, combined with robust digital technology, empower MSMEs to better seize opportunities in a competitive landscape.

Table 1. Variable and Indicator Description

Variable	Indicator	Description	Source
Strategy	Digital Marketing Strategy	Tactics used to promote products/services via digital channels (e.g., social media, SEO).	Chaffey, D. (2021). Digital Marketing.
	Operational Strategy	Methods to optimize internal processes using digital tools (e.g., ERP systems, automation).	Slack, N. (2019).
Seizing Opportunities	Market Trend Identification	Ability to recognize emerging trends and shifts in consumer behavior..	Kotler, P., & Keller, K. L. (2016). Marketing Management.
	Response Effectiveness	Speed and effectiveness in responding to identified opportunities.	Teece, D. J. (2007). Explicating Dynamic Capabilities.
Digital Technology	Technology Adoption Level	Degree to which digital tools and platforms are integrated into business operations.	Venkatesh, V., et al. (2012). Unified Theory of Acceptance and Use of Technology.
	Digital Infrastructure	Assessment of the	Brynjolfsson, E., &

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	Quality	robustness and reliability of digital systems in place.	McAfee, A. (2014). The Second Machine Age.

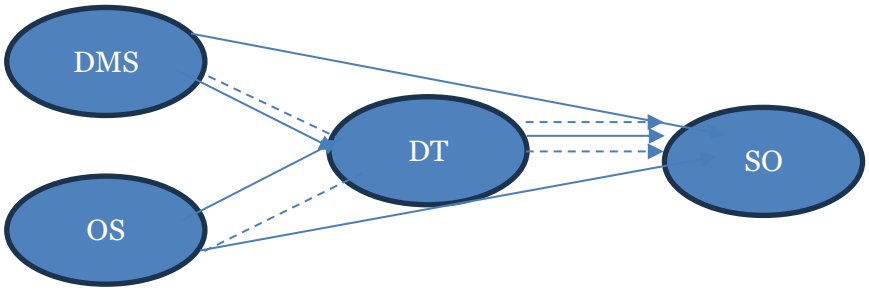


Figure 1. Conceptual Framework

Hypothesis :

H1: There is a positive relationship between Digital Marketing Strategy and Seizing Opportunities in MSMEs.

Rationale: A well-defined digital marketing strategy enhances brand visibility and customer engagement, leading to better identification and response to market opportunities.

H2: There is a positive relationship between Operational Strategy and Seizing Opportunities in MSMEs.

Rationale: An effective operational strategy optimizes internal processes, enabling MSMEs to respond more efficiently to emerging opportunities.

H3: There is a positive relationship between Digital Technology and Seizing Opportunities in MSMEs.

Rationale: The integration of effective digital technology optimizes processes, allowing MSMEs to respond more efficiently to emerging opportunities.

H4: Digital Technology moderates the relationship between Digital Marketing Strategy and Seizing Opportunities.

Rationale: The effectiveness of a digital marketing strategy in seizing opportunities is strengthened by the level of digital technology adoption within the organization.

H5: Digital Technology moderates the relationship between Operational Strategy and Seizing Opportunities.

Rationale: The impact of an operational strategy on seizing opportunities is enhanced by the sophistication and reliability of digital tools utilized by MSMEs

METHODOLOGY

Materials and Methods

This study employs a quantitative research design, utilizing surveys to collect data from Small and Medium Enterprises (SMEs) in Makassar City, which has a total population of approximately 17,867 SMEs. To determine the appropriate sample size for this research, Slovin's formula was applied, using a margin of error of 5%. The calculation yielded a sample size of approximately 391 SMEs, ensuring statistical significance for the analysis. Data will be collected through a structured questionnaire consisting of closed-ended questions. The survey will include sections on demographics, digital marketing strategy, operational strategy, digital technology adoption, and the ability to seize market opportunities. The questionnaire will be distributed via online platforms, such as email and social media, as well as through in-person visits to enhance response rates.

Data analysis will involve descriptive statistics to summarize the findings, alongside correlation and regression analyses to examine the relationships between digital strategies, technology adoption, and the ability to seize

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opportunities. Statistical software, such as SPSS or R, will be utilized for these analyses. Ethical considerations will be paramount, with all participants informed about the study's purpose and their rights, ensuring confidentiality of the data collected. Limitations of the study will include potential biases in self-reported data and considerations regarding the generalizability of the findings based on response rates..

Ethical Considerations

Ethical considerations will be paramount throughout the study. Participants will be informed about the purpose of the research, the voluntary nature of their participation, and their right to withdraw at any time without any consequences. Informed consent will be obtained from all participants prior to data collection. Additionally, measures will be taken to ensure the confidentiality and anonymity of respondents; all data collected will be stored securely and used solely for research purposes. Findings will be reported in aggregate form to prevent identification of individual respondents. The study will adhere to ethical guidelines in research, ensuring transparency and respect for the rights of all participants.

Characteristics of Respondents

To effectively analyze the impact of digital strategies and technology adoption on the performance of Small and Medium Enterprises (SMEs) in Makassar City, it is essential to understand the characteristics of the respondents involved in this study. The following table summarizes key demographic and business-related factors, including business size, industry sector, business age, digital marketing adoption, technology utilization, and educational background. This information will provide valuable context for interpreting the study's findings.

Table 2. Characteristic Respondent Makassar SME's

Characteristic	Categories	Accumulation	Percentage (%)
Business Size	Micro Enterprises: 1-9 employees	150	38.5
	Small Enterprises: 10-49 employees	120	30.8
	Medium Enterprises: 50-250 employees	121	30.7
Industry Sector	Retail	100	25.6
	Manufacturing	80	20.5
	Services	90	23.1
	Agriculture	60	15.4
	Technology	61	15.5
Business Age	New: 0-5 years	100	25.6
	Established: 6-15 years	130	33.3
	Mature: 16+ years	161	41.1

Source : Data Processed (2024)

The table above illustrates the diverse characteristics of the respondents, highlighting the variety of business sizes, industry sectors, and levels of digital marketing and technology adoption. Understanding these characteristics is crucial for interpreting the relationships examined in this study, as they may influence the ability of SMEs to leverage digital strategies effectively. Analyzing the data within this context will provide insights into how different factors contribute to the overall performance and competitiveness of SMEs in the evolving digital landscape

RESULTS AND DISCUSSION

Validity Test

In examining the effectiveness of various strategies on business performance, it is essential to evaluate the Average Variance Extracted (AVE) for each variable. Table 3 presents the AVE results for key factors influencing SMEs, including Digital Marketing Strategy, Digital Technology, Operational Strategy, and Seizing Opportunities. These measures

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provide insight into the validity and reliability of the constructs used in this study, highlighting their significance in enhancing business performance (Heir & Black, 2023):

Table 3. Results of Average Variance Extracted (AVE)

Variables	Average Variance Extracted (AVE)	Validation
Digital Marketing Strategy	0.663	Valid
Digital Technology	0.583	Valid
Operational Strategy	0.653	Valid
Seizing Opportunities	0.674	Valid

Source: (Primary Data Processed, 2024)

In examining the effectiveness of various strategies on business performance, it is essential to evaluate the Average Variance Extracted (AVE) for each variable. Table 3 presents the AVE results for key factors influencing SMEs, including Digital Marketing Strategy, Digital Technology, Operational Strategy, and Seizing Opportunities. These measures provide insight into the validity and reliability of the constructs used in this study, highlighting their significance in enhancing business performance (Heir & Black, 2023)

Discriminant Validity

In evaluating the relationships between various constructs, the Fornell-Larcker criterion serves as a valuable tool for assessing discriminant validity. This criterion compares the square root of the Average Variance Extracted (AVE) for each construct with the correlations between constructs. A higher AVE indicates that a construct explains more variance in its indicators than the variance explained by other constructs. Table 4 presents the results of the Fornell-Larcker criterion, highlighting the relationships among Digital Marketing Strategy, Digital Technology, Operational Strategy, and Seizing Opportunities in relation to Access to Financial Information, Economic Environment, Information Technology Usage, and Investment Decisions (Heir & Black, 2024).

Table 4 Result of Fornell-Larcker Criterion

	Access to Financial Information (AFI)	Economic Environment (EE)	Information Technology Usage (ITU)	Investment Decisions (ID)
Digital Marketing Strategy	0.814			
Digital Technology	0.567	0.764		
Operational Strategy	0.694	0.572	0.808	
Seizing Opportunities	0.651	0.648	0.663	0.821

Source: (Primary Data Processed, 2024)

The results indicate that the constructs demonstrate adequate discriminant validity, as evidenced by the square root of the AVE values being greater than the correlations with other constructs. This supports the robustness of the measurement model and the distinctiveness of each construct in the context of the study

Reliability Test

In order to assess the reliability of the various constructs measured in this study, a reliability test was conducted using Cronbach's Alpha. This statistical measure helps determine the internal consistency of the variables, ensuring that they are reliable indicators of the underlying concepts. The results of the reliability test are presented in Table 5.

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Table 5 Reliability Test Results

Variables	Cronbach Alpha	Reliability
Digital Marketing Strategy	0.746	Reliable
Digital Technology	0.642	Reliable
Operational Strategy	0.733	Reliable
Seizing Opportunities	0.759	Reliable

Source: (Primary Data Processed, 2024)

The results indicate that all variables exhibit acceptable levels of reliability, with Cronbach Alpha values above the commonly accepted threshold of 0.60, confirming their suitability for further analysis (Heir & Black, 2024). This reliability reinforces the validity of the constructs being measured in the context of this research.

Measurement Model Testing (Inner Model)

The following figure illustrates the structural relationships among key variables within the study. Specifically, it highlights the interactions between Digital Marketing Strategy, Digital Technology, Operational Strategy, and Seizing Opportunities. This model aims to provide insights into how these constructs influence each other, thereby reinforcing the importance of a cohesive approach to digital strategies in business. As noted by Heir and Black (2024), understanding these relationships is crucial for optimizing operational efficiencies and strategic decision-making.

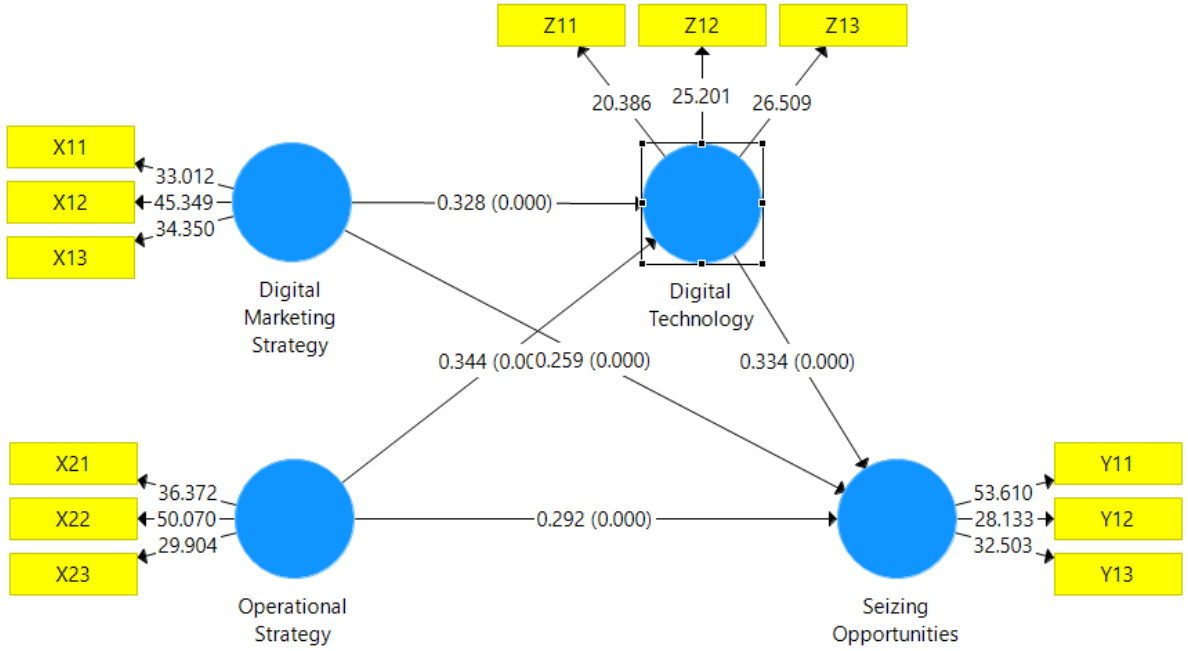


Figure 2. Structural Inner Model

The analysis presented in the diagram underscores the significant pathways among the variables, particularly emphasizing the role of Digital Technology as a central element influencing both Operational Strategy and Seizing Opportunities. These findings align with the theoretical framework established by Heir and Black (2024), further supporting the notion that an integrated digital approach can enhance business outcomes. Future research should continue to explore these dynamics to deepen our understanding of their impact on organizational success.

Hypothesis Test Results

Table 6 presents the results of the structural equation modeling analysis, highlighting the relationships between various strategic dimensions. The metrics include the original sample values, sample means, standard deviations, T-

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statistics, and P-values, which collectively illustrate the strength and significance of the hypothesized paths. These findings are crucial for understanding the interplay between digital marketing strategies, digital technology, operational strategies, and the ability to seize opportunities (Heir & Black, 2024).

Table 6. Hypothesis Test Results

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Digital Marketing Strategy -> Digital Technology	0.328	0.326	0.060	5.510	0.000
Digital Marketing Strategy -> Seizing Opportunities	0.259	0.258	0.054	4.813	0.000
Digital Technology -> Seizing Opportunities	0.334	0.337	0.046	7.179	0.000
Operational Strategy -> Digital Technology	0.344	0.349	0.063	5.480	0.000
Operational Strategy -> Seizing Opportunities	0.292	0.292	0.049	5.912	0.000

Source: (Primary Data Processed, 2024)

The analysis indicates that all paths are statistically significant, with P-values well below the threshold of 0.05. Notably, the relationship between digital technology and seizing opportunities shows the highest T-statistic, underscoring its strong influence in the model. These insights are vital for practitioners aiming to enhance strategic decision-making and leverage technology effectively (Heir & Black, 2024).

Hypothesis 1: The Impact of Digital Marketing Strategy on Digital Technology

The results indicate a significant positive effect of the digital marketing strategy on digital technology ($\beta = 0.328$, $p < 0.001$). This finding underscores the importance of integrating digital marketing strategies with technological advancements. As Cha (2015) suggests, organizations that effectively harness IT-enabled transformation can enhance their operational capabilities and improve their market positioning. The integration of digital marketing into technology adoption allows companies to streamline processes, enhance customer engagement, and improve data analytics capabilities, fostering a more agile business environment. This synergy not only drives technological innovation but also ensures that marketing efforts are aligned with technological capabilities, enabling a more responsive approach to market demands.

Hypothesis 2: The Impact of Digital Marketing Strategy on Seizing Opportunities

The strong positive relationship between the digital marketing strategy and the ability to seize opportunities ($\beta = 0.259$, $p < 0.001$) highlights the role of digital marketing as a critical enabler for SMEs in dynamic market conditions. Fiseha and Oyelana (2015) emphasize that SMEs are pivotal in local economic development, often adapting quickly to changes and seizing new opportunities as they arise. Effective digital marketing strategies enable these organizations to gather and analyze market data, identify emerging trends, and engage with customers in real-time. This capability allows SMEs to pivot their strategies rapidly, ensuring they capitalize on new opportunities that competitors may overlook. The findings suggest that a proactive digital marketing approach is essential for SMEs seeking to enhance their competitive advantage in increasingly saturated markets.

Hypothesis 3: The Impact of Digital Technology on Seizing Opportunities

The robust positive relationship identified between digital technology and the ability to seize opportunities ($\beta = 0.334$, $p < 0.001$) further reinforces the critical role of technological capabilities in driving business success. Li (2017) articulates that digital transformation equips SMEs with the tools necessary to respond swiftly to market changes and

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customer preferences. Technologies such as data analytics, customer relationship management (CRM) systems, and digital communication platforms enable organizations to not only identify but also act on new opportunities effectively. The results suggest that firms that invest in digital technology are better positioned to leverage their operational capabilities for strategic advantage, thus enhancing their responsiveness to market dynamics.

Hypothesis 4: The Impact of Operational Strategy on Digital Technology

The significant influence of operational strategy on digital technology ($\beta = 0.344$, $p < 0.001$) indicates that a well-defined operational framework is essential for successful technology integration. Ash (2003) discusses how effective enterprise management can facilitate e-business transformation, which is crucial in today's digital landscape. An operational strategy that prioritizes technological investments ensures that resources are allocated effectively and that employees are trained to use these technologies efficiently. This alignment not only enhances operational efficiency but also fosters a culture of innovation, where employees are encouraged to explore new technological solutions that can improve processes and customer experiences.

Hypothesis 5: The Impact of Operational Strategy on Seizing Opportunities

The notable positive impact of operational strategy on seizing opportunities ($\beta = 0.292$, $p < 0.001$) demonstrates that strategic operational planning plays a vital role in enabling organizations to navigate complex market environments. The OECD (2008) highlights the importance of SMEs in global value chains, suggesting that a strategic operational framework allows these businesses to identify and exploit opportunities for growth. By integrating operational strategies with market intelligence and agile practices, organizations can respond effectively to shifts in consumer behavior and competitive pressures. This approach ensures that SMEs are not only reactive but also proactive in their pursuit of new business opportunities, ultimately leading to sustained growth and market relevance.

CONCLUSION

This study highlights the critical relationships between digital marketing strategies, operational strategies, digital technology, and the ability of SMEs to seize opportunities. The findings indicate that a robust digital marketing strategy significantly enhances technology adoption, which in turn empowers organizations to identify and act on emerging market opportunities. Moreover, the integration of a well-defined operational strategy is essential for effectively leveraging digital tools and optimizing organizational processes.

The positive correlations observed affirm that SMEs that strategically align their marketing and operational frameworks with technological advancements are better positioned to thrive in dynamic market environments. As organizations navigate the complexities of digital transformation, embracing these strategies will be vital for sustaining competitiveness and fostering innovation.

Overall, this research contributes to the literature on IT-enabled organizational transformation, emphasizing the necessity for SMEs to adapt to the evolving landscape of digital commerce. Future studies should investigate the long-term impacts of these strategies on business resilience and explore how SMEs can continuously evolve in response to technological advancements and market shifts.

IMPLICATIONS FOR THEORY AND PRACTICE

This study has significant implications for both theory and practice. From a theoretical perspective, it reinforces the framework surrounding IT-enabled organizational transformation by highlighting the interconnectedness of digital marketing strategies and technological adoption. Future research should explore this nexus further, particularly how different marketing approaches can be tailored to enhance technology uptake across various sectors. Additionally, the findings suggest that operational strategy plays a mediating role between digital marketing and technology adoption, indicating that a robust operational framework is essential for maximizing the benefits of digital initiatives. This opens avenues for investigating how operational strategies can be optimized to facilitate better alignment with digital marketing efforts.

In terms of practical implications, SMEs should prioritize integrating their digital marketing and operational strategies to enhance their technological capabilities. The evidence suggests that organizations that strategically align

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these elements are better positioned to identify and seize market opportunities. Practitioners should focus on developing comprehensive training programs that equip employees with the skills needed to leverage digital technologies effectively. Furthermore, investing in data analytics and customer relationship management systems can provide valuable insights that inform strategic decision-making, ultimately driving growth and competitiveness in an increasingly digital marketplace

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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