



วารสารธรรมเพื่อชีวิต

JOURNAL OF DHAMMA FOR LIFE

ISSN: 2822-048X

<https://soo8.tci-thaijo.org/index.php/dhammalife/index>

Original Research Article

The Impact of Digital Orientation and Dynamic Capabilities on the Competitive Advantage of Small and Medium-sized Enterprises

Lyusheng Li^{1*}, A.K. Mahbulul Hye², & Sukumarn Shumnij³

ARTICLE INFO

Name of Author &
Corresponding Author: *

1. Lyusheng Li*

Faculty of Management, Shinawatra
University, Thailand.
Email: 609899006@qq.com

2. A.K. Mahbulul Hye

Faculty of Management, Shinawatra
University, Thailand.
Email: mahbulul.h@siu.ac.th

3. Sukumarn Shumnij

Faculty of Management, Shinawatra
University, Thailand.
Email: sukumarn.s@siu.ac.th

Keywords:

Digital Orientation, Dynamic Capability,
Competitive Advantage, Environmental
Uncertainty

Article history:

Received: 11/12/2025

Revised: 11/01/2026

Accepted: 10/03/2026

Available online: 13/04/2026

How to Cite:

Li, L. et al. (2026). The Impact of Digital Orientation and Dynamic Capabilities on the Competitive Advantage of Small and Medium-sized Enterprises. *Journal of Dhamma for Life*, 32(3), 57-73.

ABSTRACT

This study the research aims to: (1) analyze the influence of digital orientation on competitive advantage, (2) evaluate its impact on the development of dynamic capabilities, and (3) explore the relationship between dynamic capabilities and competitive advantage. The study is grounded in the integration of digital orientation theory, dynamic capability theory, and competitive advantage frameworks to develop a comprehensive model explaining how SMEs can strengthen their market position in uncertain environments. A quantitative research design was employed, with data collected from 456 manufacturing SMEs using structured questionnaires as the primary research instrument. The data were analyzed using SPSS for descriptive statistics and preliminary analysis, and AMOS for structural equation modeling (SEM) to test the proposed hypotheses and examine the relationships among the constructs.

The findings indicate that digital orientation has a significant positive effect on both dynamic capabilities and competitive advantage. Additionally, dynamic capabilities significantly enhance competitive advantage and serve as a mediator in the relationship between digital orientation and competitive advantage. The results further reveal that environmental uncertainty positively moderates the relationship between dynamic capabilities and competitive advantage, strengthening this relationship under higher levels of uncertainty. This study contributes to the literature by providing an integrated perspective on the mechanisms through which digital orientation drives SME competitive advantage. It also offers practical insights for SME managers on leveraging digital transformation and capability development to sustain competitiveness in dynamic and uncertain business environments.



Introduction

Digital transformation has emerged as a critical driver of competitiveness for small and medium-sized enterprises (SMEs), particularly in rapidly evolving and technology-driven markets. However, many SMEs continue to rely on outdated technologies and constrained operational frameworks, which significantly limit their ability to compete effectively and adapt to changing environments. These challenges accelerate the need for organizational reform and the enhancement of enterprise digitization. By leveraging the flexibility of digital tools and change-oriented strategies, firms can better assess competitive threats, identify emerging market demand trends, and ultimately improve their competitiveness (Raihan, 2024). Despite these opportunities, SMEs face substantial limitations in developing dynamic capabilities. A key issue lies in their insufficient environmental awareness, which restricts their ability to detect and respond to market shifts and technological advancements in a timely manner. Furthermore, limited internal and external resources, coupled with weak innovation capacity, present significant barriers to growth and transformation. These constraints have a direct and profound impact on the competitive advantage of SMEs (Torough et al., 2023). Recent studies suggest that enhancing digital orientation can significantly strengthen SMEs' competitive advantage, particularly through the mediating role of dynamic capabilities (Faruque et al., 2024). Digital transformation initiatives enable firms to optimize internal resource allocation and improve capacity utilization, thereby fostering collaboration and enhancing overall competitiveness. The development of dynamic capabilities, in turn, allows SMEs to reconfigure resources and build new strategic advantages in a digital environment (Asikin et al., 2024). Nevertheless, further research is needed to better understand the intermediary mechanisms through which digital orientation influences firm performance (Raihan, 2024). In increasingly volatile and complex external environments, dynamic capabilities play a crucial role in identifying new opportunities for organizational growth. However, empirical evidence indicates that environmental uncertainty remains inevitable and largely uncontrollable, potentially hindering enterprise development and eroding competitive advantage. As such, environmental uncertainty represents a critical moderating variable that warrants further investigation in the context of SME competitiveness (Channuwong, 2024; Alshaurah et al., 2023). To address these gaps, this study seeks to answer the following research questions:

RQ1: What impact does digital orientation have on the competitive advantage of small and medium-sized enterprises?

RQ2: What impact does digital orientation have on the dynamic capabilities of small and medium-sized enterprises?

RQ3: How do dynamic capabilities contribute to the competitive advantage of small and medium-sized enterprises?

RQ4: Do dynamic capabilities mediate the relationship between digital orientation and the competitive advantage of small and medium-sized enterprises?

RQ5: How does environmental uncertainty moderate the relationship between dynamic capabilities and the competitive advantage of small and medium-sized enterprises?

To answer these questions, this study analyzes data collected from 456 Chinese manufacturing SMEs. The findings aim to identify significant pathways for enhancing digital transformation and provide empirical evidence on how digital orientation and dynamic capabilities can strengthen competitive advantage in SMEs.



Literature Review and Theoretical Framework

Research hypothesis of digital orientation and competitive advantage of small and medium-sized enterprises

Studying the digital transformation of small and medium-sized firms in the industrial sector is crucial for sustaining competitive advantage (Li et al., 2022). Digital transformation enables organizations to optimize the utilization of digital technology, enhance production efficiency, expand client bases, penetrate new markets, and achieve varying levels of competitive advantage (Kessler et al., 2025). Through the integration of advanced technology, organizations can enhance manufacturing processes (Xue et al., 2024). Research indicates that the digital transformation of manufacturing processes can enable organizations to attain variable productivity to a certain degree. The product supply chain is obstructed; otherwise, it will result in a decrease in sales, which represents the best optimized digital supply chain (Sarkar et al., 2022). Furthermore, enterprise reform is incorporated into the digital marketing sector. Versatility and responsiveness of marketing channels. Assist in significantly improving the competitiveness of businesses (Wamba et al., 2020). The digital transformation of small and medium-sized firms' manufacturing processes, supply chains, and marketing channels has emerged as the crucial factor for achieving a competitive edge. To expedite the digital advancement of small and medium-sized firms and consistently enhance their competitiveness. Therefore, the research hypothesis is proposed:

H1: Digital orientation has a significant positive impact on the competitive advantage of small and medium-sized enterprises.

Research assumptions of digital orientation and dynamic capability.

Digitalization is crucial for both internal and external operations of small and medium-sized organizations. Through perceptual abilities, enterprises can seize opportunities presented by market fluctuations and technological advancements; integration capabilities facilitate the effective incorporation of digital technology into diverse processes, ensuring optimal resource allocation and collaborative efforts during digital transformation (Saputra et al., 2024). Moreover, research on resource integration capability indicates that dynamic capacities can effectively facilitate company digitalization and foster organizational development (Praditya & Purwanto, 2024). It elucidates the competencies inherent in the comprehensive execution of digitalization, encompassing the function of dynamic capabilities (Soluk & Kammerlander, 2021). Within the context of production, AI-assisted predictive analysis is employed to discern fresh opportunities (Al Dhaheri et al., 2024). Consequently, technological progress and resource integration constitute advantageous conditions for digitalization (Csiki, 2023). Enhance production efficiency by upgrading equipment and optimizing resource integration (Frank Doyle, 2019). Innovations in the production process enable firms to swiftly capitalize on emerging market opportunities, fostering new prospects for growth (Xue et al., 2024). The digital marketplace can rapidly establish varied marketing channels, enhance the efficiency of digital marketing, disseminate swiftly, and integrate into the digital marketing sector (Jukkola, 2021). Moreover, businesses utilize digital technology to effectively adapt to fluctuating market demand. Digital marketing channels emphasize the perception, integration, innovation, and various competencies of organizations. The aforementioned perspectives assist organizations



in further investigating the meaningful trajectory (via M. Sebastian, 2017). Drawing from the aforementioned research and demonstration, the overarching enhancement of production, supply chain, and marketing for small and medium-sized enterprises under digital guidance is emphasized. When these enterprises leverage dynamic capabilities to advance digital applications and enhance efficiency, digital guidance is identified as an independent variable. This primarily investigates the dynamic capabilities of perception, resource integration, and innovation, which are crucial for the digitalization of small and medium-sized enterprises. Based on the above views, the research hypothesis is proposed:

H2: Digital orientation has a significant positive impact on Dynamic Capability.

Research assumptions on dynamic capabilities and competitive advantages of small and medium-sized enterprises

Dynamic capability is intricately linked to the competitive advantage of small and medium-sized enterprises (SMEs). Employing dynamic skills enables organizations to sustain and enhance their competitiveness. Investigate the amalgamation of internal and external resources, identify and cultivate new goods, enhance efficiency, satisfy market demand, and secure competitive advantage (Banerjee et al., 2018). Consequently, research by Nguyet and Quynh (2024) indicates that dynamic competence is the primary source of competitive advantage, as evidenced by the market share of firms. By recognizing possibilities in environmental changes, organizations can implement adaptive solutions and enhance dynamic capacities (Ward & Osiyevsky, 2025). Considering the elements of resource integration, implement diverse reforms to foster development and establish robust dynamic capabilities through the internal and external integration of enterprises, thereby underscoring the augmentation of competitive advantage in the evolving digital landscape (BARI et al., 2022). The capacity for perception enables organizations to capitalize on developmental prospects (Mushangai, 2023), integrate AI technologies, and progressively cultivate the ability to address complicated issues. The capacity for innovation enables organizations to discover novel methods of generating value (Rhee, 2020). It constitutes the origin of actual competitive advantage (Saputra et al., 2024). Elements that offer diverse viewpoints for research to improve competitiveness in a swiftly evolving industry (Boikanyo, 2024). This study examines the correlation between dynamic skills and the competitive advantage of SMEs. This research is valuable for augmenting the competitive edge of small and medium-sized firms. Therefore, the research hypothesis is proposed:

H3: Dynamic capabilities have a significant positive impact on the competitive advantage of small and medium-sized enterprises.

Research on the Mediating Effect of Dynamic Capability

The prospects presented by the reconfiguration of corporate digital transformation, considering the market's intensification and the swift technological advancement, emphasize the importance of leveraging special dynamic capabilities, representing the forefront of enterprise research (Banerjee et al., 2018). Dynamic skills can indirectly assist organizations in acquiring and sustaining competitive advantage. Research indicates that dynamic capabilities can perpetually refresh and refine the resources and competencies of organizations using digital technology, hence augmenting their competitive edge (Yohanes et al., 2021). According



to study conducted by Kessler et al. (2025), Sarkar et al. (2022), and Wamba et al. (2020) regarding enterprise digital transformation. In conjunction with the studies conducted by Sarkar et al. (2022) and Csiki (2023) on dynamic capabilities. Subsequently, based on the pertinent studies by Ward and Osiyevsky (2025) and Bari et al. (2022), competitive advantage is established. This study employs dynamic capability as the mediating variable to investigate its intermediary effect in the manufacturing sector between digital orientation and the competitive advantage of small and medium-sized enterprises, thereby facilitating the application of digital technologies in these enterprises to augment their competitive advantage. Based on the above views, the research hypothesis is put forward:

H4: Dynamic capabilities have a mediating effect between digital orientation and competitive advantage for small and medium-sized enterprises.

Research on the moderating effect of environmental uncertainty

In market volatility, competitors can readily seize market share from one another. Consequently, it is suggested that firms must possess the capability to swiftly adapt to market fluctuations. From this viewpoint, research can be conducted to comprehend the potential of dynamic capabilities and preemptively structure the market (Kwiatkowska, 2022). We can sustain a competitive advantage in volatile markets solely by leveraging the ability system to create temporary advantages (Kim & Yang, 2024). Dynamic capabilities enable various organizations to attain their most essential objectives with efficiency. To guarantee that internal and external resources are developed and integrated in reaction to fluctuations in the volatile environment, so enabling a flexible response to market changes and securing a competitive edge (Fainshmidt et al., 2019). Moreover, in a complex and volatile environment, dynamic capability is considered the pivotal element of enterprise digitization. Research indicates a substantial relationship between the two, facilitating firms' adaptation and competitiveness in this environment (Damrong Siri et al., 2022; Alshourah et al., 2023). This study positively regulates the relationship between dynamic capabilities and the competitive advantage of SMEs during environmental unpredictability. Effectively addressing the competitive advantage of SMEs during periods of environmental volatility is of paramount importance. Therefore, based on the above analysis, the following research hypotheses are proposed:

H5. The relationship between the dynamic ability of positive regulation of environmental uncertainty and the competitive advantage of small and medium-sized enterprises.



Conceptual Framework

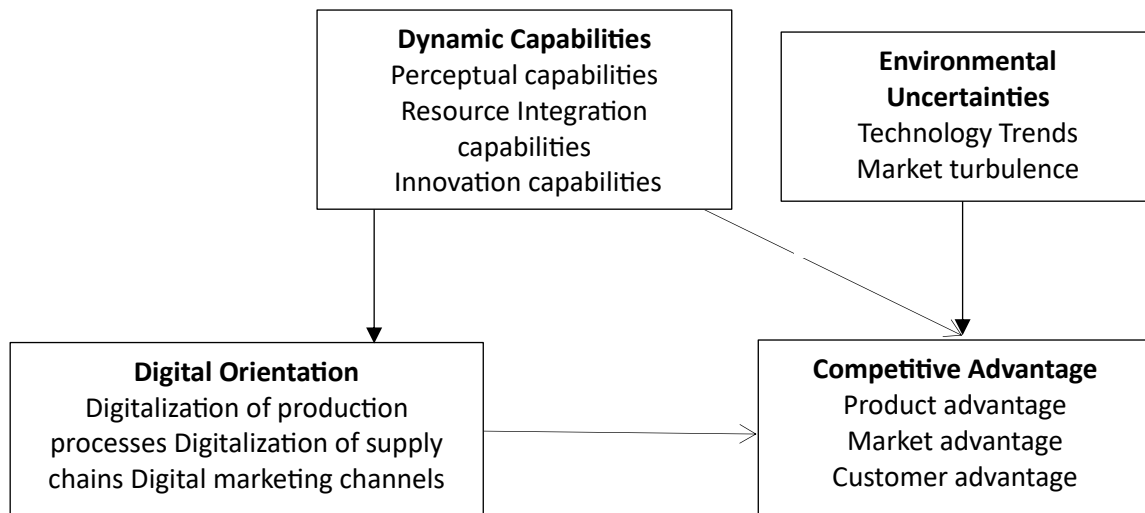


Figure 1 Theoretical Framework

Objectives

1. Analyze the influence of digital orientation on competitive advantage.
2. Evaluate its impact on the development of dynamic capabilities.
3. Explore the relationship between dynamic capabilities and competitive advantage.

Methodology

This study employs a quantitative research methodology to investigate key factors influencing small and medium-sized manufacturing enterprises (SMEs). A structured and systematic approach was adopted to ensure the rigor, reliability, and validity of the research process and findings. The research design is both descriptive and explanatory in nature, as it seeks not only to describe the characteristics of the target population but also to examine the relationships among the variables under investigation.

The study population comprises small and medium-sized manufacturing firms operating in major industrial regions of China, including Shanghai, Jiangsu, Guangzhou, and other relevant areas. These regions were selected due to their high concentration of manufacturing activities and their significant contribution to economic development. From this population, a sample was drawn using a probability sampling technique, specifically simple random sampling, to ensure that each unit within the population had an equal chance of selection. This method enhances the representativeness of the sample and reduces potential sampling bias. A total of 456 valid questionnaires were collected and deemed suitable for subsequent analysis, providing a robust dataset for statistical examination.

Primary data were gathered through the use of a structured questionnaire, which was developed based on an extensive review of the relevant literature and aligned with the objectives of the study. The questionnaire was designed to capture respondents' perceptions, attitudes, and experiences related to the constructs being examined. To ensure clarity and content validity, the instrument was carefully reviewed and refined prior to full-scale administration.

The measurement of variables was conducted using a five-point Likert scale, ranging from "strongly disagree" to "strongly agree." This scaling method is widely recognized for its effectiveness in quantifying subjective responses and facilitating statistical analysis in social science research. The use of a standardized scale also contributes to the consistency and comparability of the data collected.

Data analysis was carried out using Statistical Package for the Social Sciences (SPSS) and Analysis of Moment Structures (AMOS). A series of statistical techniques were employed to comprehensively analyze the data. Descriptive statistics were first used to summarize the demographic characteristics of the respondents and provide an overview of the data distribution. Reliability and validity tests, including Cronbach's alpha and factor analysis, were conducted to assess the internal consistency and construct validity of the measurement scales. Subsequently, correlation analysis was performed to examine the relationships among the variables, followed by regression analysis to evaluate the strength and direction of these relationships and to test the proposed hypotheses.

Overall, the methodological framework adopted in this study ensures a high level of analytical rigor and provides a solid foundation for deriving meaningful and generalizable conclusions regarding small and medium-sized manufacturing enterprises.

Results

This section empirically tests the theoretical model and research hypothesis by collecting sample data. Analyze and discuss the data analysis results.

Reliability and validity analysis

According to the reliability and validity test of reference (Saputra et al., 2024; Tang et al., 2023), this study uses Cronbach's alpha, the value verification scale of combined reliability CR and convergent validity AVE, which requires the standard value Cronbach's alpha > 0.7, CR > 0.7, AVE > 0.5. The research results in Table 1 show that the Cronbach's alpha value of each dimension is between (0.875-0.917) > 0.7 means that the internal consistency reliability is good, the CR value of each dimension is between (0.942-0.958) > 0.7 means that the latent variable measurement model is more reliable. The value of AVE in each dimension is between (0.606-0.642) > 0.5, indicating good convergence validity, and the overall verification results meet the requirements. The correlation score of $P < 0.05$ was significant, indicating that the correlation of variables met the requirements.



Table 1 Validation results of descriptive and correlation analysis

Test items	Digital orientation	Dynamic capabilities	Competitive advantage	Environmental uncertainty
Digital orientation	0.628			
Dynamic capabilities	.517**	0.617		
Competitive advantage	.490**	.533**	0.606	
Environmental uncertainty	.505**	.574**	.535**	0.642
√AVE	0.793	0.786	0.779	0.801
CR	0.956	0.958	0.952	0.942
Cronbach's alpha	0.912	0.917	0.906	0.875

Source: Created by the author.

Construct structural equation model diagram

This study employs Amos to construct the structural equation model, as the variables predominantly rely on a second-order assumption among latent variables, resulting in a clearly simplified model. The results are shown in the following figure.

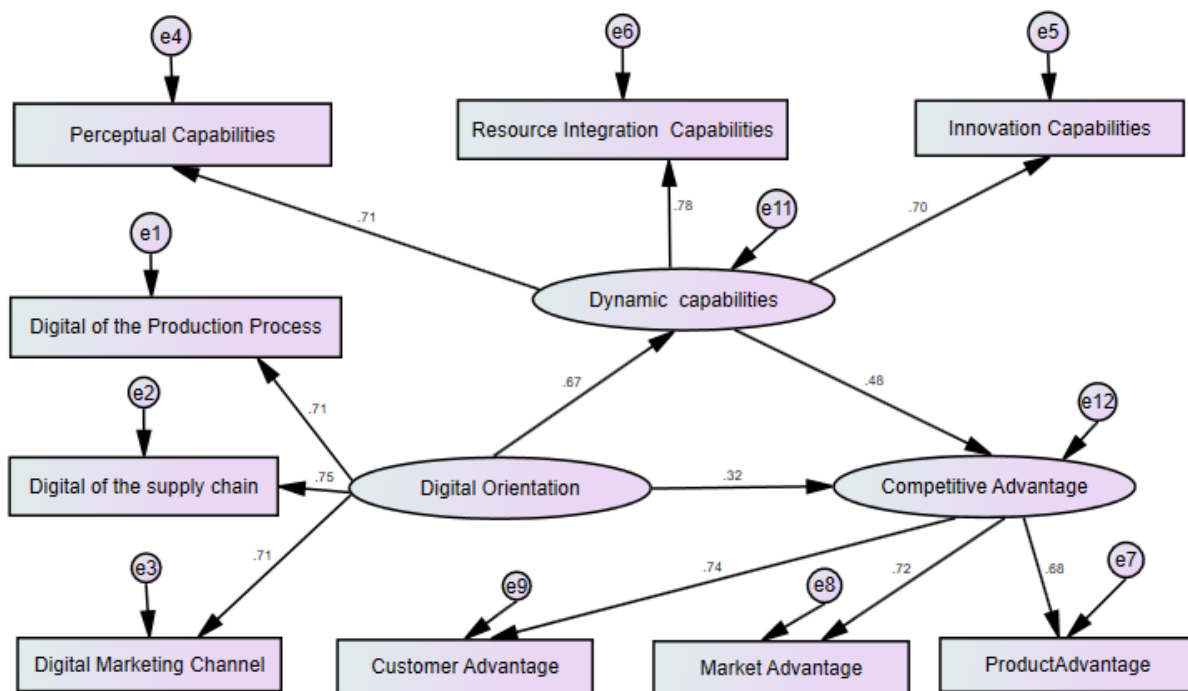


Figure 2 standardized structural equation model

Structural equation model fitting analysis

According to table 2, the overall model fitting index $\chi^2/df=1.432 < 3$; $RMSEA=0.031 < 0.10$; $RMR=0.022 < 0.05$; The values of GFI, IFI, TLI and CFI were >0.9 , respectively;



Comprehensive analysis showed that the standardized structural equation model had high fitting and aggregation validity.

Table 2 Model fitting index

Indicators	χ^2/df	RMSEA	RMR	GFI	IFI	TLI	CFI
Judgment Criteria	<3	<0.10	<0.05	>0.9	>0.9	>0.9	>0.9
Value	1.432	0.031	0.022	0.984	0.993	0.989	0.992

Source: Created by the author.

Hypothesis test

1) Hypothesis H1: Digital orientation has a significant positive impact on the competitive advantage of small and medium-sized enterprises. The research results in Table 3 show that digital orientation has a significant correlation with the competitive advantage of small and medium-sized enterprises. After adding the digital oriented variable, the interpretation of the model is stronger. Standardization coefficient ($\beta=0.321$, $P<0.001$). The results show that there is a significant positive impact relationship. Therefore, H1 is established.

2) Hypothesis H2: Digital orientation has a significant positive impact on dynamic capability.

The research results in Table 3 show that there is a significant correlation between digital orientation and dynamic capability. Standardization coefficient ($\beta=0.675$, $P<0.001$). The results show that there is a significant positive impact relationship. Therefore, H2 is established.

3) Hypothesis H3: Dynamic capabilities have a significant positive impact on the competitive advantage of small and medium-sized enterprises.

The research results in Table 3 show that there is a significant correlation between dynamic capabilities and the competitive advantage of SMEs. Standardization coefficient ($\beta=0.482$, $P<0.001$). The results show that there is a significant positive impact relationship. Therefore, H3 is established.

Table 3 hypothetical analysis results

Hypothesis	Path	Standardized Beta	S.E.	C.R.	p-Values	Decision
H1	Digital Orientation-> Competitive Advantage	0.321	0.08	3.844	***	Supported
H2	Digital Orientation-> Dynamic Capabilities	0.675	0.072	9.575	***	Supported
H3	Dynamic Capabilities-> Competitive Advantage	0.482	0.082	5.546	***	Supported

Source: Created by the author.

4) Hypothesis test of mediating effect. The mediating effect of this study was tested by



Amos, and the bootstrap test method was used to conduct 5000 repeated sampling with 95% confidence interval. According to the test results in Table 4, the standardized indirect effect β of the mediation effect path is 0.311, the 95% confidence interval is [0.202-0.47], and the standardized indirect effect confidence interval does not include 0. It means that 95% of the dynamic ability mediates between 20.2% and 47%. The standardized direct effect $\beta=0.307$, the confidence interval is [0.136-0.509], and the direct effect confidence interval does not include 0. It means that 95% of the direct effects are between 15.6% and 57.1%. According to the standardization coefficient of direct effect and indirect effect are greater than 0.3, the total effect coefficient is 0.618, the confidence interval is [0.49-0.759], and the proportion of indirect effect in the total effect is about 50.3%, indicating that dynamic capability plays an important intermediary role between digital orientation and competitive advantage. Therefore, H4: Dynamic capabilities have a mediating effect between digital orientation and competitive advantage for small and medium-sized enterprises. Establishment.

Table 4 Regression analysis results of mediating effect

Digital Orientation->Dynamic Capabilities->Competitive Advantage				
Path	Estimate	Lower	Upper	p-values
Indirect effect	0.311	0.202	0.47	***
Direct effect	0.307	0.136	0.509	***
Total effect	0.618	0.49	0.759	***

Source: Created by the author.

5) Hypothesis test of regulatory effect. The regulatory effect of this study is tested by spssau. First, the data is processed centrally, and then the regulatory variable results are analyzed as follows. From table 5, we can see the impact of environmental uncertainty. The path of environmental uncertainty*dynamic capacity ($\beta=0.265$, $t=6.562$, $P=0.000<0.05$), indicating the existence of regulatory effect from the comparative analysis of R^2 value, the trend is increasing, indicating that the explanatory power of the adjusting variable to the dependent variable is stronger. According to the significant difference of impact amplitude at different levels of environmental uncertainty, this study combined with the simple slope diagram analysis results to verify.

Table 5 Analysis of regression analysis results of regulatory effect

Environmental Uncertainties*Dynamic Capabilities->Competitive Advantage						
Path	Unstandardize d Coefficient	Standard Error	t value	p- values	Standardized Beta	R^2
Dynamic Capabilities	0.521	0.039	13.420	0.000**	0.533	0.284
Environmental Uncertainties	0.327	0.044	7.437	0.000**	0.341	0.362



Environmental Uncertainties*Dynamic Capabilities->Competitive Advantage						
Environmental Uncertainties*	0.302	0.046	6.562	0.000**	0.265	0.417
Dynamic Capabilities						

Source: Created by the author.

As shown in Figure 3, the slopes of high (+1SD) in the slope diagram are greater than those of low (-1SD). Verification shows that the slope of high-level environmental uncertainty is greater than that of low-level environmental uncertainty. With the increase of environmental uncertainty, dynamic ability plays a key role in coping with it, and competitive advantage is enhanced, playing a positive regulatory role.

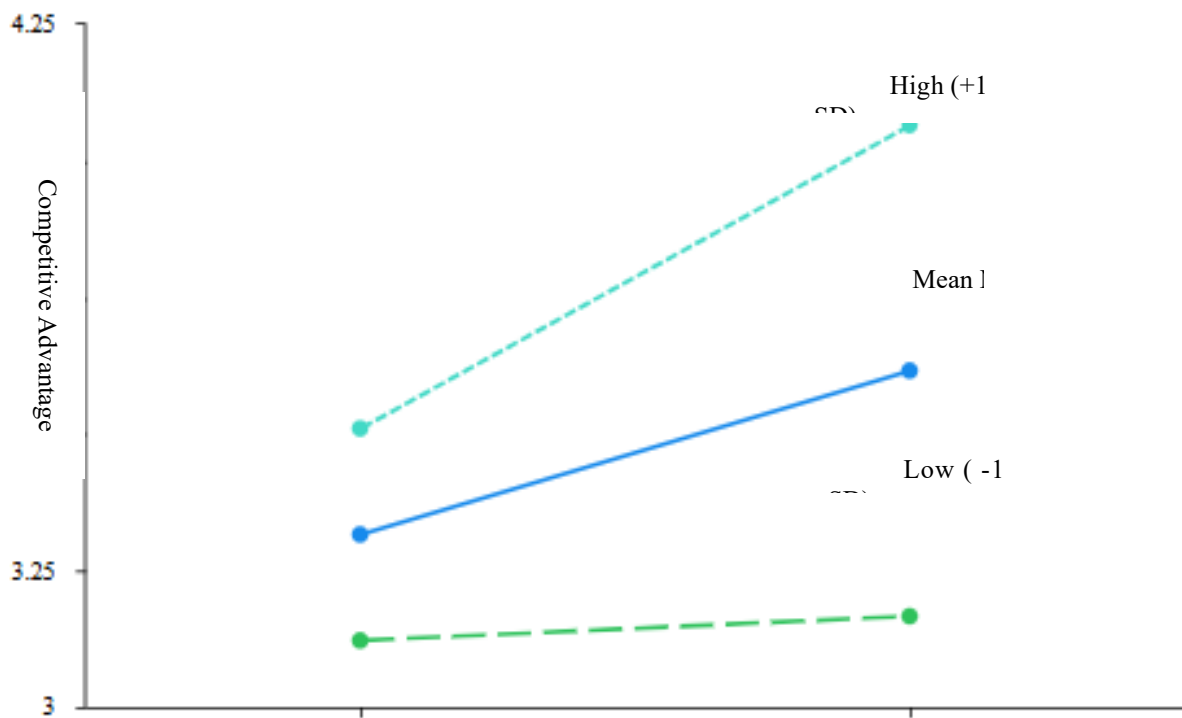


Figure 3 simple slope diagram Dynamic Capabilities

Table 6 learned, the high-level adjustment variable (+1SD) :($\beta=0.555$, $p=0.000<0.05$), indicating that dynamic capability has a significant positive impact on competitive advantage under high-level adjustment. Mean level adjustment variable: $\beta=0.3$, $p=0.000<0.05$), indicating a significant positive impact. When the uncertainty is one standard deviation higher than the mean value, the competitive advantage increases by 0.555 units for each increase in dynamic capability ($P<0.001$); Low level adjustment variable (-1SD): ($\beta=0.044$, $p=0.467>0.05$), The 95% CI [-0.076, 0.164] interval contains 0, indicating that it is not significant. The results show that the higher the environmental uncertainty is, the more prominent the value creation effect of dynamic capability is, which verifies the value of dynamic capability in improving competitive advantage in turbulent environment. Therefore, H5. The relationship between the dynamic ability of positive regulation of environmental uncertainty and the competitive advantage of small and medium-sized enterprises establishment.

Table 6 Simple slope analysis results

Moderator Variable Level	Regression Coefficient	Standard Error	t-value	p-values	Confidence Interval	
Mean	0.3	0.043	6.956	0	0.215	0.385
High (+1SD)	0.555	0.055	10.102	0	0.447	0.663
Low(-1SD)	0.044	0.061	0.727	0.467	-0.076	0.164

Source: Created by the author.

Discussion

Discussion on the impact of digital orientation on the competitive advantage of small and medium-sized enterprises

This study posits that digital orientation significantly enhances the competitive advantage of small and medium-sized enterprises. The empirical analysis results ($\beta=0.321$, $p<0.001$) validate this hypothesis, indicating that hypothesis H1 is affirmed. The research findings indicate a strong correlation between digital orientation and the competitive process, which is linked to the impetus for accelerating the growth and market expansion of small and medium-sized enterprises, with increased emphasis on the value derived from digital orientation. This research conclusion substantiates the pertinent findings (Kessler et al., 2025; Haider et al., 2024), presents new opportunities and challenges for the advancement of small and medium-sized enterprises in the manufacturing sector, accelerates responses to the intricate market environment, enhances the market share of small and medium-sized enterprises, and generates additional advantages. This result indicates that the digital transformation of production processes, supply chains, and marketing channels will establish a foundation for the advancement of small and medium-sized manufacturing enterprises. Significantly augment the competitive edge of products, markets, and clientele.

Discussion on the impact of digital orientation on Dynamic Capability

This study posits that digital orientation significantly enhances dynamic capabilities. The empirical analysis results indicate that the data ($\beta=0.675$, $P<0.001$) substantiate this hypothesis, thereby confirming H2. The research findings indicate that dynamic capabilities are the crucial element in addressing the digitalization challenges faced by small and medium-sized enterprises. Digitalization has emerged as a crucial developmental trajectory for the production and operations of small and medium-sized enterprises, alleviating their constraints. Facilitate the digital transformation of small and medium-sized enterprises, expedite technological reform and enhancement, and optimize enterprise value. A greater degree of digital orientation correlates with an increased adoption of new technologies and enhanced technological innovation capability. This research conclusion further substantiates the pertinent findings (Saputra et al., 2024; Soluk & Kammerlander, 2021). The analysis of the regression coefficient reveals that the influence of digital orientation on dynamic capabilities is progressively increasing, while the significance of the capabilities varies. Small and medium-



sized enterprises require robust capabilities that are crucial at various stages of development. This result elucidates that the dynamic capabilities of perception, resource integration, and innovation expedite the digital transformation of SMEs. Oversee the holistic enhancement of manufacturing production, supply chain, and marketing.

Discussion on the impact of dynamic capabilities on the competitive advantage of small and medium-sized enterprises

This study posits that H3: dynamic capabilities significantly enhance the competitive advantage of SMEs. The empirical analysis results indicate that the data ($\beta=0.482$, $p<0.001$) corroborate this hypothesis, thus confirming hypothesis H3. The research findings indicate that dynamic capabilities augment the competitive advantage of SMEs. The findings indicate that small and medium-sized manufacturing enterprises ought to investigate both internal and external capabilities to augment their competitive advantage. Dynamic capability encompasses numerous factors; varying factors yield distinct values, thereby generating additional opportunities and innovative resources that assist enterprises in enhancing efficiency. The research conclusion more effectively corroborates the pertinent findings (Torough et al., 2023; Nguyet & Quynh, 2024). The implication of this result is that small and medium-sized manufacturing enterprises must adopt a long-term perspective on competitive advantage, focus on developing dynamic capabilities, and progressively cultivate these capabilities through perception, resource integration, and innovation.

Discussion on the mediating effect of dynamic capabilities

This study posits that H4: dynamic capabilities serve as a mediating factor in the relationship between digital orientation and the competitive advantage of SMEs, as evidenced by empirical data analysis ($\beta=0.311$, $p<0.001$). Thus, if H4 is validated, the findings indicate that leveraging digital orientation can augment the competitive advantage of SMEs via dynamic capabilities. Manufacturing enterprises can enhance their competitiveness by broadening the scope of digitalization. The findings indicate a significant intermediary effect, suggesting that small and medium-sized manufacturing enterprises should prioritize digital transformation and development by selecting appropriate capabilities to optimize the utilization of digital technology, ultimately enhancing their competitive advantage.

Discussion on the regulatory effect of environmental uncertainty

This study posits H5: the correlation between the dynamic capacity for positive regulation of environmental uncertainty and the competitive advantage of SMEs. The hypothesis is corroborated by the findings of empirical data analysis ($\beta=0.265$, $t=6.562$, $p=0.000<0.05$). Assuming H5 is supported, the research indicates that in a stable and predictable environment, SMEs can leverage dynamic capabilities to penetrate future markets. Conversely, in a turbulent and unpredictable technological landscape, it is imperative to adopt a digital orientation to identify latent customer needs, explore new digital markets, capitalize on significant innovation opportunities presented by technological changes, and enhance competitive advantage through the improvement of dynamic capabilities. Dynamic capabilities leverage diverse competencies to enhance market share, thereby improving the survival rate



and longevity of small and medium-sized enterprises. It is emphasized that during periods of significant market turbulence, a thorough analysis of external data pertaining to small and medium-sized enterprises is essential to investigate the correlation between market turbulence and competitive advantage, as well as its potential regulatory effect. This study confirms environmental uncertainty as a regulatory variable and examines the boundary conditions affecting the relationship between dynamic capabilities and competitive advantage, thereby supporting the theory.

Conclusion

Based on the research questions, this study puts forward relevant hypotheses, expounds the theory of digital orientation, dynamic capability, environmental uncertainty and competitive advantage, and conducts a questionnaire survey on 456 small and medium-sized manufacturing enterprises. Through the empirical analysis of the data, the paper draws the research conclusions: (1) Digital orientation promotes the competitive advantage of small and medium-sized enterprises in manufacturing industry. (2) Dynamic capabilities promote the digital transformation reform and upgrading of small and medium-sized manufacturing enterprises. (3) Dynamic capabilities of small and medium-sized manufacturing enterprises promote competitiveness. (4) Dynamic capabilities play an intermediary role between digital orientation and SMEs' competitive advantage. (5) Environmental uncertainty is playing a moderating role between dynamic capabilities and SMEs' competitive advantage. The hypothesis of research conclusion is tenable.

Recommendations

Practical Recommendations

1. SMEs should embed digital thinking in leadership, culture, and decision-making processes.
2. Use digital tools strategically (e.g., data analytics, automation, e-commerce platforms) to enhance responsiveness and efficiency rather than adopting them in isolation.
3. Provide digital transformation support programs tailored to SMEs, especially manufacturing firms with limited resources.

Future Research Directions

1. Compare SMEs across developing vs. developed economies to assess contextual differences.
2. Conduct long-term studies to observe how digital orientation evolves into sustained competitive advantage over time.
3. Use case studies or interviews to deepen understanding of how SMEs actually build dynamic capabilities in practice.
4. Future studies could examine which specific digital technologies (AI, IoT, ERP systems) most strongly enhance dynamic capabilities.



References

- Al Dhaheri, M. H., Ahmad, S. Z., & Papastathopoulos, A. (2024). Do environmental turbulence, dynamic capabilities, and artificial intelligence force SMEs to be innovative? *Journal of Innovation & Knowledge*, 9(3).
- Alshourah, S., Altawalbeh, M., Mansour, M., Al Haraisa, Y., & Al-Kharabsheh, A. (2023). Digital strategic orientation and firm's performance: the moderating effect of environmental uncertainty. *Polish Journal of Management Studies*, 28.
- Asikin, M. Z., Fadilah, M. O., Saputro, W. E., Aditia, O., & Ridzki, M. M. (2024). The Influence of Digital Marketing on Competitive Advantage and Performance of Micro, Small and Medium Enterprises. *International Journal of Social Service and Research*, 4(03), 963-970.
- Banerjee, C. S., Farooq, A., & Upadhyaya, S. (2018). The relationship between dynamic capabilities, competitive advantage & organizational performance. *International Journal of Interdisciplinary Research and Innovations*, 6(3), 603-610.
- Bari, N., Chimhundu, R., & Chan, K.-C. (2022). Dynamic capabilities to achieve corporate sustainability: a roadmap to sustained competitive advantage. *Sustainability*, 14(3), 1531.
- Boikanyo, D. H. (2024). *Utilization of 4IR Technologies to enhance strategic intelligence and dynamic capabilities for a sustainable competitive advantage*.
- Csiki, O., Demeter, K., & Losonci, D. (2023). How to improve firm performance? The role of production capabilities and routines. *International Journal of Operations & Production Management*, 43(13), 1-26.
- Channuwong, S. (2014). The strategic management of Coco-Cola and Starbucks company. *Journal of Business Administration and Languages*, 2(2), 55-58.
- Damrongsiri, T., Harnphanich, B., Snongtaweepon, T., Channuwong, S., Benjawatanapon, W., Raktakanishtha, P., Vongsurakrai, S., Siribensanont, C. (2022). Leadership of administrators for improving mission implementation of Thai private higher education institutions. *Journal of Positive School Psychology*, 6(9), 2558-2568.
- Fainshmidt, S., Wenger, L., Pezeshkan, A., & Mallon, M. R. (2019). When do dynamic capabilities lead to competitive advantage? The importance of strategic fit. *Journal of Management Studies*, 56(4), 758-787.
- Faruque, M. O., Chowdhury, S., Rabbani, G., & Nure, A. (2024). Technology adoption and digital transformation in small businesses: Trends, challenges, and opportunities. *International Journal for Multidisciplinary Research*, 6(10.36948).
- Frank Doylea, D. J. C. (2019). Steps towards digitization of manufacturing in an SME environment.pdf. *Procedia Manufacturing*, 38, 540–547.
- Ina M. Sebastian, J. W. R., Cynthia Beath, Martin Mocker, Kate G. Moloney, Nils O. Fonstad. (2017). How Big Old Companies Navigate Digital. *MIS Quarterly Executive*, 16(3), 197–213.
- Jukkola, M. (2021). *Digital transformation and strategic crisis responses in B2B marketing: a dynamic capabilities approach*.
- Kessler, A., Frank, H., & Fuetsch, E. (2025). Conceptualizing digitalization orientation as a strategic posture—How to boost the impact of digital technologies in businesses: A qualitative good practices approach. *Technological Forecasting and Social Change*, 213, 123997.
- Kim, C.-G., & Yang, O.-S. (2024). Global Companies' Dynamic Response to Business Environment Uncertainty through Digital Transformation: Sustainable Digital Quality—Customer Value—Market Performance Relationships. *Sustainability*, 16(15), 6541.



- Kwiatkowska, A. (2022). *The interplay of resources, dynamic capabilities and technological uncertainty on digital maturity*. *Zeszyty Naukowe. Organizacja i Zarządzanie/Politechnika Śląska*.
- Li, X., Wu, T., Zhang, H., & Yang, D. (2022). Digital Technology Adoption and Sustainable Development Performance of Strategic Emerging Industries. *Journal of Organizational and End User Computing*, 34(8), 1-18.
- Mushangai, D. (2023). Dynamic capabilities: Axiomatic formation of firms' competitive competencies. *Social Sciences & Humanities Open*, 8(1), 100654.
- Nguyet, N. T. M., & Quynh, L. T. (2024). Food Processing Enterprises Performance: Roles of Dynamic Capabilities and Competitive Advantage. *유통과학연구*, 22(6), 57-68.
- Praditya, R. A., & Purwanto, A. (2024). Linking the influence of dynamic capabilities and innovation capabilities on competitive advantage: PLS-SEM analysis. *PROFESOR: Professional Education Studies and Operations Research*, 1(02), 6-10.
- Raihan, A. (2024). A review of the digitalization of the small and medium enterprises (SMEs) toward sustainability. *Global Sustainability Research*, 3(2), 1-16.
- Rhee, M. S., A. R. A. E. (2020). Innovation-orientated technology assimilation strategy and Korean SMEs' enhancing innovation capability, competitive advantage and firm performance. *International Journal of Innovation Management*, 24.
- Saputra, M. H., Utomo, M. N., Ariansyah, K., Wismayanti, Y. F., & Ansyah, R. H. A. (2024). Small and medium-sized enterprises dynamic capabilities and competitive advantage: The mediating effect of digitalization. *Entrepreneurial Business and Economics Review*, 12(3), 41-67.
- Sarkar, B., Dey, B. K., Sarkar, M., & Kim, S. J. (2022). A smart production system with an automation technology and dual channel retailing. *Computers & Industrial Engineering*, 173, 108607.
- Soluk, J., & Kammerlander, N. (2021). Digital transformation in family-owned Mittelstand firms: A dynamic capabilities perspective. *European Journal of Information Systems*, 30(6), 676-711.
- Tang, H., Yao, Q., Boadu, F., & Xie, Y. (2023). Distributed innovation, digital entrepreneurial opportunity, IT-enabled capabilities, and enterprises' digital innovation performance: a moderated mediating model. *European Journal of Innovation Management*, 26(4), 1106-1128.
- Torough, S., Ayatse, F., Hanmaikyur, T., Umogbai, M., & Adudu, C. (2023). Dynamic Capabilities and Competitive Advantage of Quoted Telecommunication Companies in Nigeria. *International Journal of Business, in Africa*, 13(10), 14-36.
- Wamba, S. F., Dubey, R., Gunasekaran, A., & Akter, S. (2020). The performance effects of big data analytics and supply chain ambidexterity: The moderating effect of environmental dynamism. *International Journal of Production Economics*, 222, 107498.
- Ward, M., & Osiyevskyy, O. (2025). Design-led innovation as a generative source of competitive advantage. *Business Horizons*, 68(5), 687-698.
- Xue, F., Tan, Y., & Anwar, S. (2024). Innovation strategy, digital transformation and competitive advantage of manufacturing enterprises: evidence from China. *European Journal of Innovation Management*.

Yohanes, Y., Margaretha, F., & Sudiby, Y. A. (2021). Analysis Of the Influence of Dynamic Capabilities on Company Performance Mediated by Competitive Advantage. *Eduvest-Journal of Universal Studies*, 1(10), 1.007-001.020.

