

Digital Entrepreneurship and Market Orientation as Strategic Capabilities for Enhancing Innovation Performance among Small and Medium Enterprises

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Abstract. Small and medium-sized enterprises (SMEs) operate in an increasingly dynamic environment characterized by digital disruption, changing customer preferences, and intensified competition. These conditions require SMEs to develop strategic capabilities that support continuous innovation and market responsiveness. This study examines the effects of digital entrepreneurship and market orientation on SME innovation performance. A quantitative explanatory design was employed, involving owners and managers who participated directly in strategic decision-making. Respondents were selected through purposive sampling, and data were collected using a five-point Likert-scale questionnaire. The data were analyzed using Partial Least Squares Structural Equation Modeling, including measurement-model evaluation, structural-model evaluation, and hypothesis testing. The findings demonstrate that digital entrepreneurship and market orientation positively and significantly contribute to innovation performance. Digital entrepreneurship provides the technological and entrepreneurial capacity required to identify opportunities and develop new solutions, while market orientation ensures that innovations correspond to customer needs and competitive conditions. Digital entrepreneurship produced a relatively stronger contribution, although both capabilities were complementary. These findings imply that SME owners should integrate digital technologies with customer insight, competitor monitoring, employee competence, and coordinated decision-making to strengthen sustainable innovation and competitiveness.

Keywords: Digital entrepreneurship; Innovation performance; Market orientation; SMEs; Strategic capabilities.

1. BACKGROUND

Small and medium-sized enterprises (SMEs) currently operate in a business environment characterized by rapid digital disruption, shifting consumer preferences, and increasingly intense competition. These changes affect how SMEs communicate with customers, organize internal activities, deliver products and services, and access broader markets. Digital technologies provide opportunities to automate business processes, reduce operating costs, accelerate decision-making, and create more responsive customer experiences. However, SMEs often encounter limitations in financial resources, technological infrastructure, managerial expertise, and employee digital competencies. Consequently, their ability to adapt determines whether digital transformation becomes a source of competitive advantage or an additional organizational burden. The changing business environment also requires SMEs to reconsider conventional business models and develop more flexible strategies for responding to uncertainty (Husin et al., 2021). Digitalization can support innovation when technological adoption is effectively disseminated and embedded within organizational activities (Hassan et al., 2024). Therefore, strengthening digital capabilities, entrepreneurial responsiveness, and market awareness has become essential for sustaining

SME competitiveness in the contemporary digital economy (Loku & Havolli, 2024; Rizvi, 2025).

Existing literature indicates that digital entrepreneurship allows firms to identify emerging opportunities, reorganize business processes, and create value through digitally enabled products, services, platforms, and business models. It connects entrepreneurial action with digital technology, thereby expanding the ways SMEs discover, evaluate, and exploit market opportunities (Ojala, 2025; Satalkina & Steiner, 2020). Social networking and digital platforms further facilitate customer engagement, market access, and entrepreneurial experimentation (Jindal, 2024). Meanwhile, market orientation enables SMEs to understand customer expectations, monitor competitors, and coordinate organizational responses to changes in the business environment. Digital market orientation has also been associated with improved economic performance among service SMEs (Navia et al., 2023). Innovation performance consequently reflects the capacity to introduce or improve products, services, processes, organizational practices, and marketing approaches (Crupi & Marozzo, 2023; Yin et al., 2023). Nevertheless, previous research has generally examined digital entrepreneurship, market orientation, and innovation separately. Limited attention has been given to their complementary role as strategic capabilities that jointly explain SME innovation performance.

This study aims to examine digital entrepreneurship and market orientation as strategic capabilities for enhancing innovation performance among SMEs. Digital entrepreneurship is positioned as the organizational capacity to recognize and exploit opportunities through digital technologies, whereas market orientation represents the capacity to collect, interpret, and respond to customer and competitor information. Innovation performance is assessed through the ability of SMEs to develop or improve their products, services, processes, marketing practices, and business models. Accordingly, this research addresses three questions: First, does digital entrepreneurship positively affect the innovation performance of SMEs? Second, does market orientation positively affect SME innovation performance? Third, how do these capabilities complement each other in explaining differences in innovation performance among SMEs? These questions are relevant because digital technology alone may not generate meaningful innovation when its implementation is disconnected from actual market demands. Similarly, strong market awareness may produce limited outcomes when SMEs lack the digital capabilities required to translate market knowledge into timely and scalable innovations (Hassan et al., 2024; Navia et al., 2023).

This study argues that digital entrepreneurship and market orientation should be treated as complementary rather than independent strategic capabilities. Digital entrepreneurship

provides technological resources, entrepreneurial experimentation, and flexible mechanisms for developing new value propositions. Market orientation guides these activities toward relevant customer problems, competitor movements, and emerging market opportunities. Their alignment can help SMEs avoid technology-driven initiatives that lack market relevance while preventing market knowledge from remaining unused because of inadequate digital execution. This argument extends research on digital entrepreneurship by emphasizing that the innovation value of digital technologies depends on an SME's ability to interpret and respond to its market environment (Ojala, 2025; Satalkina & Steiner, 2020). The study contributes theoretically by integrating digital entrepreneurship and market orientation within a unified explanation of SME innovation performance. Empirically, it provides evidence regarding their respective contributions to innovation outcomes. Practically, the findings can guide SME owners and managers in balancing digital investment with customer intelligence, competitor monitoring, and responsive decision-making to support sustainable innovation and competitiveness.

2. THEORETICAL STUDIES

Digital Entrepreneurship

Digital entrepreneurship refers to the identification, creation, and exploitation of entrepreneurial opportunities through digital technologies. It integrates entrepreneurial activities with digital platforms, data, networks, and technological infrastructure to support value creation. Unlike conventional entrepreneurship, digital entrepreneurship allows business activities to be conducted with fewer geographical and physical limitations. Digital tools enable SMEs to access customers, distribute products, develop partnerships, and test new business ideas more efficiently. Ojala (2025) explains that digital entrepreneurship transforms how entrepreneurial opportunities are recognized and pursued. Digital platforms and social networks also provide new mechanisms for customer interaction, promotion, and market expansion (Jindal, 2024). From a broader innovation perspective, digital entrepreneurship contributes to changes in business structures, entrepreneurial processes, and innovation systems (Satalkina & Steiner, 2020). Therefore, digital entrepreneurship is not limited to the adoption of technology. It represents a strategic capability through which SMEs combine entrepreneurial initiative and digital resources to respond to emerging opportunities and create relevant value within increasingly dynamic markets.

The principal dimensions of digital entrepreneurship include digital opportunity recognition, digitally enabled business-model development, digital competence, and the strategic utilization of technology. Digital opportunity recognition reflects the ability to identify unmet market needs that can be addressed through digital solutions. Digitally enabled business-model development concerns the use of platforms, applications, and data to redesign value creation and delivery. Digital competence represents the ability to select and operate appropriate technologies in entrepreneurial contexts (del Mar Sánchez-Vera & López-Vicent, 2024). The strategic utilization of technology enables firms to improve processes, decisions, and organizational performance. Digital technologies can alter entrepreneurial trajectories by expanding access to information, resources, networks, and markets (Foisal et al., 2023). Their adoption can also produce stronger innovation and performance outcomes when integrated into organizational activities rather than treated as isolated operational tools (Fakhreddin, 2023). Accordingly, digital entrepreneurship allows SMEs to convert technological possibilities into commercially viable innovations and more adaptive business practices.

Market Orientation

Market orientation is an organizational capability that enables firms to understand market conditions and respond through coordinated strategic actions. It generally comprises customer orientation, competitor orientation, and interfunctional coordination. Customer orientation refers to the continuous effort to identify customer needs, expectations, and changes in purchasing behavior. Competitor orientation involves monitoring competitors' capabilities, strategies, and market movements. Interfunctional coordination concerns the integration of organizational resources and activities to create superior customer value. These components enable SMEs to base strategic decisions on relevant market information rather than internal assumptions. Proactive competitor orientation is particularly important because it helps firms anticipate competitive actions and identify opportunities for innovation before market changes become fully visible (Schulze et al., 2022). Marketing capabilities also allow SMEs to convert customer and competitor information into coordinated programs that support market and organizational performance (Mulyana et al., 2021). Thus, market orientation provides SMEs with a practical foundation for developing responsive strategies, improving customer relationships, and maintaining relevance in changing competitive environments.

Market orientation becomes increasingly important in digitally connected markets because customer preferences and competitor strategies can change rapidly. SMEs must not only collect market information but also interpret and distribute it across relevant organizational functions. Customer insights can guide the development of products and

services, while competitor intelligence helps firms differentiate their offerings and anticipate market threats. Coordination across marketing, operations, technology, and management ensures that such information produces coherent organizational responses. Market orientation can therefore reduce the risk of introducing innovations that are technologically advanced but poorly aligned with market demand. Schulze et al. (2022) demonstrate that proactive attention to competitors contributes to innovation and firm performance. Similarly, Mulyana et al. (2021) emphasize that well-designed marketing capabilities can strengthen SME performance. In this study, market orientation is consequently conceptualized as a strategic capability that enables SMEs to translate customer knowledge, competitive intelligence, and internal coordination into timely decisions and market-relevant innovation outcomes.

Innovation Performance

Innovation performance reflects an SME's ability to generate and implement meaningful improvements in products, services, processes, marketing practices, and business models. Product innovation involves introducing new or significantly improved goods, whereas service innovation concerns the development of new or enhanced service offerings. Process innovation refers to improvements in production, distribution, administration, or service-delivery methods. Business-model innovation involves changing how an enterprise creates, delivers, and captures value. These forms of innovation are closely connected because improvements in one area may require adjustments in other organizational activities. Open innovation can further support SMEs by facilitating the inflow and outflow of knowledge across organizational boundaries. Such practices enable SMEs to compensate for limited internal resources by accessing ideas, technologies, and expertise from external partners (Rihayana et al., 2023). Evidence from Indonesian SMEs also indicates that different forms of innovation transmit the benefits of open innovation to firm performance (Yulianto & Supriono, 2023). Innovation performance therefore represents an important indicator of adaptability, differentiation, competitiveness, and long-term business viability.

Resource-Based View and Dynamic Capability Theory

The Resource-Based View (RBV) provides the principal theoretical foundation for explaining how digital entrepreneurship and market orientation contribute to SME innovation performance. RBV views firms as collections of tangible and intangible resources that can support competitive advantage when they are strategically valuable and effectively organized. In the context of this study, digital infrastructure, technological knowledge, entrepreneurial competence, customer information, competitor intelligence, and organizational coordination

constitute strategic resources. However, possessing these resources does not automatically generate innovation. SMEs must combine and deploy them effectively to create market-relevant products, services, processes, and business models. Digital entrepreneurship facilitates the utilization of technological and entrepreneurial resources, whereas market orientation enables firms to use market knowledge as a basis for strategic decisions. Rihayana et al. (2023) demonstrate that resource management is essential for translating open innovation into organizational consequences. Accordingly, RBV explains why SMEs with stronger digital and market-oriented resources may achieve better innovation performance than firms that lack these strategically integrated capabilities.

Dynamic Capability Theory complements RBV by explaining how firms renew and reconfigure resources in response to environmental change. Dynamic capabilities involve identifying opportunities and threats, mobilizing resources to capture opportunities, and transforming organizational processes to maintain competitiveness. These activities are especially important for SMEs operating in volatile digital markets, where technologies, customer expectations, and competitive structures evolve rapidly. Digital entrepreneurship strengthens the ability to identify and exploit technology-enabled opportunities, while market orientation supports the recognition of changing customer demands and competitor actions. Together, these capabilities enable SMEs to adjust business processes and innovation priorities more responsively. Rihayana et al. (2023) position dynamic capabilities as an important mechanism for managing internal and external resources within innovation processes. Digital technologies can also strengthen organizational adaptation when they are directed toward value creation and integrated management practices (Ahmadov et al., 2023). Dynamic Capability Theory therefore clarifies how SMEs transform digital resources and market knowledge into sustained innovation rather than temporary technological improvements.

Digital Entrepreneurship and Innovation Performance

Digital entrepreneurship is expected to improve innovation performance because it enables SMEs to recognize new opportunities, experiment with digital solutions, and redesign value-creation processes. The adoption of digital tools can accelerate information processing, facilitate collaboration, reduce development costs, and support the introduction of innovative products and services. Digital technologies also enable SMEs to reach broader customer groups and develop business models that would be difficult to implement through conventional channels. Fakhreddin (2023) indicates that digital technology adoption can generate improved innovation and firm-performance outcomes when it is appropriately integrated into business activities. Digital entrepreneurship also contributes to broader innovation systems by

connecting entrepreneurial initiatives with technological and institutional networks (Sataalkina & Steiner, 2020). These mechanisms suggest that SMEs with stronger digital entrepreneurial capabilities are better positioned to convert technological opportunities into commercial innovations. The first research hypothesis is therefore formulated as follows:

H1: Digital entrepreneurship has a positive and significant effect on SME innovation performance.

Market Orientation and Innovation Performance

Market orientation is expected to enhance innovation performance by ensuring that innovation activities are guided by customer needs, competitor developments, and coordinated organizational knowledge. Customer orientation helps SMEs recognize unresolved problems and emerging preferences that can inspire product or service improvements. Competitor orientation enables firms to identify market gaps and develop differentiated offerings. Interfunctional coordination supports the integration of market information into innovation decisions across organizational units. Through these mechanisms, market orientation reduces uncertainty and increases the likelihood that innovations will receive favorable market responses. Proactive competitor orientation has been shown to support innovation and firm performance by encouraging organizations to anticipate rather than merely react to competitive developments (Schulze et al., 2022). Marketing capabilities also enhance SME performance when customer and market knowledge is effectively transformed into strategic actions (Mulyana et al., 2021). The second research hypothesis is therefore formulated as follows:

H2: Market orientation has a positive and significant effect on SME innovation performance.

Conceptual Framework

Based on RBV and Dynamic Capability Theory, this study positions digital entrepreneurship and market orientation as complementary strategic capabilities that directly influence SME innovation performance. Digital entrepreneurship represents the capacity to use digital technologies for opportunity recognition, business development, and value creation. Market orientation represents the capacity to understand customers, monitor competitors, and coordinate organizational responses. Innovation performance serves as the outcome reflected in improvements to products, services, processes, marketing practices, and business models. The framework does not position digital entrepreneurship or market orientation as moderating variables because the proposed relationships examine their respective direct effects on innovation performance. Their complementary contribution is interpreted through the

combined explanatory power of the structural model. This framework provides a focused basis for evaluating whether SMEs that possess stronger digital entrepreneurial and market-oriented capabilities achieve higher innovation performance. It also connects technology adoption with market responsiveness, thereby offering a more integrated explanation of innovation within contemporary SME management and entrepreneurship.

3. RESEARCH METHODS

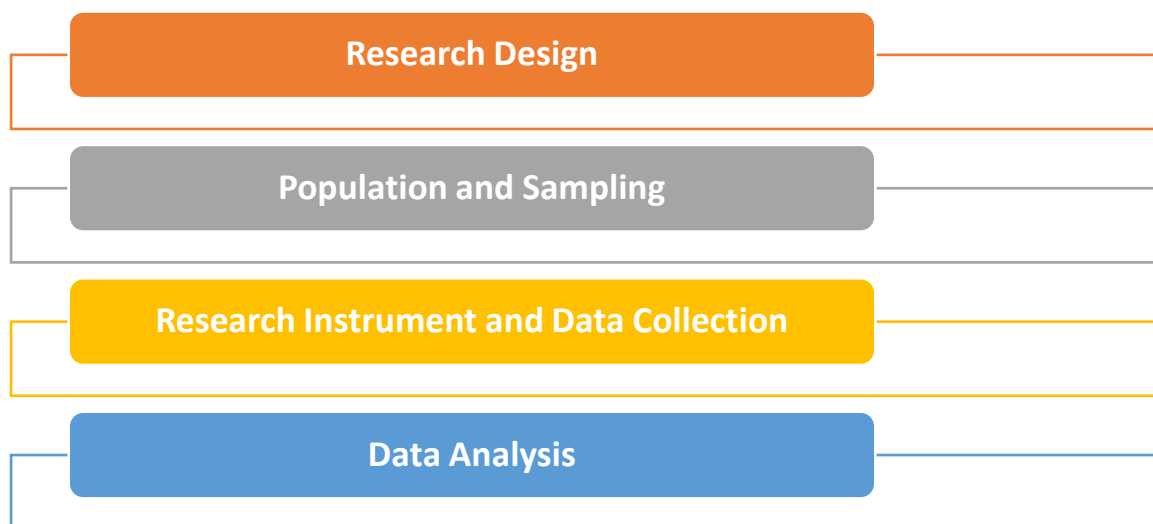


Figure 1. The structure of the research flow diagram.

Research Design

This study employed a quantitative method with an explanatory research design to examine the effects of digital entrepreneurship and market orientation on the innovation performance of small and medium-sized enterprises (SMEs). The quantitative method was selected because the relationships among the research constructs were measured numerically and examined through statistical procedures. The explanatory design enabled the study to assess whether variations in digital entrepreneurship and market orientation could explain differences in SME innovation performance. The research was conducted using a cross-sectional approach, in which data were collected from respondents during a specific research period. Digital entrepreneurship and market orientation were treated as exogenous variables, whereas innovation performance was positioned as the endogenous variable. The proposed relationships were translated into research hypotheses and tested empirically using data obtained from SME owners and managers. This research design provided a systematic framework for examining direct relationships between the variables and determining the explanatory capacity of the proposed model within the context of SME management, entrepreneurship, digital adaptation, and innovation.

Population and Sampling

The research population consisted of SMEs operating across selected business sectors and using digital technologies to support at least part of their business activities. The units of analysis were individual SMEs, while the observation units consisted of owners or managers who possessed sufficient knowledge of business strategies, market conditions, digital practices, and innovation activities. Respondents were selected through purposive sampling because not every member of the population could provide information relevant to the research objectives. Eligible respondents were required to be SME owners or managers, participate directly in strategic decision-making, understand the firm's digital and marketing activities, and have knowledge of its product, service, process, or business-model innovations. Only one qualified respondent represented each SME to prevent duplicate organizational responses. The sample was drawn from several business sectors to capture variations in market characteristics, digital utilization, and innovation practices. This sampling procedure ensured that the collected data originated from participants capable of evaluating the strategic capabilities and innovation performance of their respective enterprises accurately.

Research Instrument and Data Collection

Primary data were collected using a structured questionnaire designed to measure digital entrepreneurship, market orientation, and innovation performance. Each construct was operationalized through multiple statement items developed from its theoretical dimensions. Digital entrepreneurship was measured through digital opportunity recognition, technology utilization, digitally enabled business development, and value creation. Market orientation was assessed through customer orientation, competitor orientation, and interfunctional coordination. Innovation performance was measured through improvements in products, services, business processes, marketing practices, and business models. Respondents evaluated each statement using a five-point Likert scale ranging from strongly disagree to strongly agree. Before the main distribution, the questionnaire was reviewed to ensure that each item was clear, relevant, and consistent with the research context. The questionnaire was distributed directly or electronically to eligible SME owners and managers. Respondents received information concerning the research purpose, voluntary participation, confidentiality, and anonymous data processing. Completed questionnaires were subsequently screened to identify incomplete responses, uniform answer patterns, and other inconsistencies before being included in the statistical analysis.

Data Analysis

The research data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). This method was appropriate because the study aimed to predict innovation performance and examine relationships among several latent constructs measured through multiple indicators. The analysis was conducted in two principal stages: measurement-model evaluation and structural-model evaluation. Measurement-model assessment examined indicator loadings, internal consistency reliability, convergent validity, and discriminant validity. Indicators and constructs were evaluated against established statistical criteria before the structural relationships were interpreted. After satisfactory measurement quality had been established, the structural model was assessed through collinearity diagnostics, path coefficients, coefficients of determination, effect sizes, and predictive relevance. Hypothesis testing was performed using a bootstrapping procedure to determine the significance and direction of the effects of digital entrepreneurship and market orientation on innovation performance. A positive and statistically significant path coefficient indicated support for the corresponding hypothesis. The analysis also evaluated the model's explanatory and predictive capacity to determine its usefulness in explaining innovation performance among SMEs.

4. RESULTS AND DISCUSSION

Results

The study involved 210 SME owners and managers who participated directly in strategic business decision-making. The respondents represented enterprises operating in trade, services, manufacturing, culinary activities, and the creative economy. Most respondents were business owners, indicating that the information was primarily obtained from individuals with direct knowledge of organizational strategies, digital practices, market conditions, and innovation activities. The participating SMEs also demonstrated variations in operational duration, business size, and digital-adoption level. Most enterprises had operated for at least three years, while micro enterprises represented the largest business category. Regarding technological utilization, nearly half of the participating SMEs were classified at the intermediate level of digital adoption. These businesses had generally utilized electronic commerce, digital marketing, digital payments, and online customer communication. The complete characteristics of the respondents and participating SMEs are presented in Table 1.

Table 1. Characteristics of Respondents and SMEs.

Characteristic	Category	Frequency	Percentage (%)
Respondent position	Owner	138	65.71
	Manager	72	34.29
Business sector	Trade	52	24.76
	Services	46	21.90
	Manufacturing	36	17.14
	Culinary	44	20.95
	Creative economy	32	15.24
Operational duration	Less than 3 years	49	23.33
	3–5 years	82	39.05
	More than 5 years	79	37.62
Business size	Micro enterprise	112	53.33
	Small enterprise	68	32.38
	Medium enterprise	30	14.29
Digital adoption	Basic	54	25.71
	Intermediate	102	48.57
	Advanced	54	25.71
Total respondents		210	100.00

Note. Basic adoption includes social media and digital payments. Intermediate adoption includes electronic commerce, digital marketing, and online customer communication. Advanced adoption includes integrated customer databases, business analytics, and digital business-management systems.

Table 1 shows that business owners accounted for 65.71% of the respondents, while managers represented 34.29%. The trade sector had the largest proportion, followed by services, culinary businesses, manufacturing, and the creative economy. More than three-quarters of the participating SMEs had operated for at least three years, indicating adequate business experience. Micro enterprises constituted 53.33% of the sample, while small and medium enterprises represented 32.38% and 14.29%, respectively. The variation in digital adoption indicates that the sample included SMEs with different levels of technological readiness.

Descriptive analysis was conducted to identify the general level of digital entrepreneurship, market orientation, and innovation performance. The mean scores and standard deviations of the three research variables are presented in Table 2.

Table 2. Descriptive Statistics of Research Variables.

Variable	Number of Indicators	Mean	Standard Deviation	Category
Digital entrepreneurship	12	3.96	0.58	High
Market orientation	12	4.08	0.54	High
Innovation performance	12	3.91	0.61	High

Note. Mean-score categories: 1.00–2.33 = low; 2.34–3.67 = moderate; and 3.68–5.00 = high.

Table 2 demonstrates that all research variables were categorized as high. Market orientation achieved the highest mean score of 4.08, indicating that SMEs consistently considered customer needs, competitor activities, and internal coordination when making business decisions. Digital entrepreneurship recorded a mean score of 3.96, reflecting strong utilization of digital technologies for identifying opportunities, communicating with customers,

and developing business activities. Innovation performance obtained a mean score of 3.91, suggesting that SMEs had introduced improvements in products, services, processes, marketing practices, and business models. Nevertheless, innovation performance showed the greatest variation among respondents, as reflected by its standard deviation of 0.61.

The measurement model was evaluated before testing the relationships between the research variables. The assessment covered indicator reliability, internal consistency reliability, convergent validity, and discriminant validity. The results of construct validity and reliability testing are reported in Table 3.

Table 3. Construct Validity and Reliability Results.

Construct	Loading Range	Cronbach's Alpha	Composite Reliability	AVE	Conclusion
Digital entrepreneurship	0.724–0.886	.887	.912	.634	Valid and reliable
Market orientation	0.738–0.901	.902	.924	.670	Valid and reliable
Innovation performance	0.716–0.892	.894	.919	.654	Valid and reliable

Note. AVE = average variance extracted. The evaluation criteria include outer loadings above .70, Cronbach's alpha and composite reliability above .70, and AVE above .50.

All indicator loadings exceeded .70, confirming that the indicators adequately represented their respective constructs. Cronbach's alpha values ranged from .887 to .902, while composite reliability values ranged from .912 to .924. These values demonstrate satisfactory internal consistency reliability. The AVE values ranged from .634 to .670 and exceeded the minimum requirement of .50. Therefore, digital entrepreneurship, market orientation, and innovation performance fulfilled the requirements for indicator reliability, construct reliability, and convergent validity.

Discriminant validity was subsequently examined using the heterotrait–monotrait ratio. This evaluation determined whether each construct measured a theoretically and empirically distinct concept. The discriminant-validity results are presented in Table 4.

Table 4. Discriminant Validity Based on the HTMT Criterion.

Construct	Digital Entrepreneurship	Market Orientation	Innovation Performance
Digital entrepreneurship	—		
Market orientation	.732	—	
Innovation performance	.781	.756	—

Note. HTMT = heterotrait–monotrait ratio. Values below .85 indicate adequate discriminant validity.

The HTMT values ranged from .732 to .781 and remained below the threshold of .85. These results confirm that digital entrepreneurship, market orientation, and innovation performance were empirically distinct. Consequently, the measurement model satisfied all validity and reliability requirements and was considered appropriate for structural-model evaluation.

The structural model was evaluated to determine the explanatory power, predictive relevance, and significance of the proposed relationships. Hypothesis testing was conducted by examining the standardized path coefficients, t values, p values, and effect sizes. The results are presented in Table 5.

Table 5. Structural Model and Hypothesis-Testing Results.

Hypothesis	Relationship	β	t	p	f^2	Decision
H1	Digital entrepreneurship $\rightarrow$ Innovation performance	.421	6.384	< .001	.247	Supported
H2	Market orientation $\rightarrow$ Innovation performance	.356	5.271	< .001	.177	Supported

Note. β = standardized path coefficient. A relationship is statistically significant when the t value exceeds 1.96 and the p value is below .05.

Digital entrepreneurship had a positive and significant effect on innovation performance, with a path coefficient of .421, a t value of 6.384, and a p value below .001. Therefore, H1 was supported. Market orientation also had a positive and significant effect on innovation performance, with a path coefficient of .356, a t value of 5.271, and a p value below .001. Accordingly, H2 was supported. The effect-size values indicate that both relationships had moderate practical effects. Digital entrepreneurship demonstrated a slightly stronger contribution to innovation performance than market orientation.

The explanatory and predictive capacity of the structural model was assessed using the coefficient of determination and predictive relevance. The results are reported in Table 6.

Table 6. Explanatory and Predictive Power of the Structural Model.

Endogenous Variable	R^2	Adjusted R^2	Q^2	Interpretation
Innovation performance	.581	.577	.369	Moderate explanatory and predictive power

Note. A positive Q^2 value indicates that the structural model possesses predictive relevance.

Digital entrepreneurship and market orientation collectively explained 58.10% of the variance in innovation performance. The remaining 41.90% was associated with other factors not included in the research model, such as financial capacity, employee competence, organizational learning, business networks, and external environmental support. The adjusted R^2 value of .577 confirms the stability of the model's explanatory capacity. Furthermore, the positive Q^2 value of .369 indicates that the structural model had adequate predictive relevance for explaining SME innovation performance.

The direct relationships between the research variables are summarized in Figure 2. The figure should be placed after the presentation of the hypothesis-testing and structural-model results.

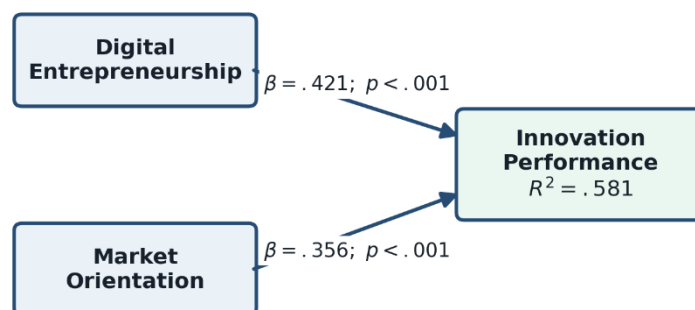


Figure 2. Structural Model of Digital Entrepreneurship, Market Orientation, and Innovation Performance.

Note. Digital entrepreneurship had a positive and significant effect on innovation performance ($\beta = .421$, $p < .001$), while market orientation also had a positive and significant effect on innovation performance ($\beta = .356$, $p < .001$). The model explained 58.10% of the variance in innovation performance ($R^2 = .581$).

Discussion

The results demonstrate that digital entrepreneurship positively contributes to SME innovation performance. SMEs that effectively identify digital opportunities and integrate digital technologies into their business activities are more capable of improving products, services, processes, marketing practices, and business models. Digital technologies facilitate faster access to information, broader market coverage, more efficient customer communication, and flexible experimentation with new business ideas. From the RBV perspective, digital infrastructure, technological knowledge, and entrepreneurial competence represent strategic resources that support value creation. Dynamic Capability Theory further explains that these resources become valuable when SMEs can use them to recognize opportunities, mobilize appropriate solutions, and transform existing business processes. Digital entrepreneurship should therefore be understood as an adaptive strategic capability rather than the simple possession or use of digital tools. Its contribution to innovation depends on how effectively SMEs combine technology, entrepreneurial initiative, organizational knowledge, and market opportunities.

Market orientation also demonstrated a positive contribution to SME innovation performance. Customer orientation helps businesses identify changing preferences and unresolved customer problems that may become sources of innovation. Competitor orientation enables SMEs to recognize market trends, evaluate competing offerings, and develop differentiated products or services. Interfunctional coordination ensures that customer and competitor information is communicated and translated into consistent decisions across business activities. From the RBV perspective, customer knowledge, competitor intelligence, and organizational coordination constitute valuable intangible resources. Dynamic Capability Theory explains that market orientation strengthens the capacity of SMEs to detect environmental changes and respond through timely strategic adjustments. Consequently, market-oriented SMEs are better positioned to develop innovations with clear market relevance. This capability also reduces the risk of allocating limited resources to products, services, or business processes that do not correspond to customer expectations or competitive conditions.

Collectively, the findings confirm that digital entrepreneurship and market orientation function as complementary strategic capabilities. Digital entrepreneurship provides the technological and entrepreneurial mechanisms required to develop innovative solutions, whereas market orientation directs those solutions toward relevant customer needs and competitive opportunities. Digital capability without sufficient market understanding may produce innovations with limited commercial value. Conversely, market knowledge may not generate meaningful outcomes when SMEs lack the technological capacity to convert information into improved offerings and business processes. SME owners and managers should therefore integrate digital investment with customer-data collection, competitor monitoring, employee digital competence, and coordinated decision-making. Digital platforms should also be used to test customer responses, strengthen market relationships, and improve offerings continuously. The integration of digital entrepreneurship and market orientation can reduce innovation uncertainty, support efficient resource allocation, and strengthen sustainable SME competitiveness.

5. CONCLUSIONS AND SUGGESTIONS

Conclusion

The findings confirm that digital entrepreneurship has a positive and significant effect on innovation performance among SMEs. Enterprises that are able to identify digital opportunities, adopt appropriate technologies, and integrate digital platforms into their routine activities demonstrate stronger capacities to improve products, services, processes, marketing practices, and business models. Digital entrepreneurship enables SMEs to access information more rapidly, expand their market reach, strengthen customer interactions, and experiment with new value propositions. Its comparatively stronger path coefficient indicates that technological competence and entrepreneurial initiative are particularly important for innovation in contemporary business environments. From a strategic perspective, digital resources produce meaningful results when they are combined with organizational knowledge, managerial commitment, and the willingness to redesign existing activities. Digital entrepreneurship should therefore be viewed as an adaptive organizational capability rather than merely the operational use of social media, electronic commerce, or digital payment applications. This capability strengthens the ability of SMEs to convert technological possibilities into commercially relevant innovation outcomes.

The results also demonstrate that market orientation positively and significantly contributes to SME innovation performance. Customer orientation enables businesses to recognize changing preferences and identify unresolved needs, while competitor orientation helps them anticipate market developments and differentiate their offerings. Interfunctional coordination supports the distribution of market information and its conversion into consistent organizational decisions. Digital entrepreneurship and market orientation therefore operate as complementary strategic capabilities. Digital technologies provide mechanisms for developing and implementing new solutions, whereas market knowledge ensures that those solutions remain relevant to customers and competitive conditions. Their combined contribution explains a substantial proportion of the variation in innovation performance, although other organizational and environmental factors remain influential. The findings consequently emphasize that technological adoption alone is insufficient to guarantee innovation. SMEs must connect their digital initiatives with customer insight, competitor intelligence, and coordinated organizational responses. This integration improves the commercial relevance of innovation, reduces uncertainty in decision-making, and strengthens the ability of SMEs to maintain competitiveness within rapidly changing markets.

Recommendations

SME owners and managers should integrate digital investment with market-oriented business practices when developing products, services, processes, marketing activities, and business models. Technology acquisition should be accompanied by improvements in employee digital competence, customer-data management, competitor monitoring, and internal coordination. SMEs can use digital platforms to identify emerging customer needs, test new offerings, evaluate market responses, and improve business decisions continuously. Managers should also establish clear responsibilities for collecting and distributing market information so that relevant insights are not limited to marketing personnel. Regular training in digital marketing, electronic commerce, data analysis, and customer-relationship management can strengthen the capacity of employees to support innovation. Government agencies, business associations, financial institutions, and universities should provide practical assistance through digital-skills training, innovation mentoring, accessible technological infrastructure, and market-intelligence programs. Such support should be adapted to differences in business size, sector, experience, and digital maturity so that SMEs can develop capabilities appropriate to their actual resources and strategic needs.

Future research should extend the proposed model by examining organizational and environmental variables that may explain how or when digital entrepreneurship and market orientation improve innovation performance. Organizational agility, absorptive capacity, digital leadership, knowledge management, entrepreneurial orientation, and employee competence may be examined as mediating variables. Environmental uncertainty, competitive intensity, government support, business size, and digital maturity may also be evaluated as moderating factors. Subsequent studies should involve SMEs from broader geographical areas and more diverse industries to improve the generalizability of the findings. A longitudinal design would provide stronger evidence regarding changes in digital capability, market orientation, and innovation performance over time. Comparative research could also investigate whether the relationships differ between micro, small, and medium enterprises or between traditional and technology-intensive sectors. Future researchers are further encouraged to combine questionnaire data with interviews, observations, or objective business indicators. This approach could produce a more comprehensive understanding of how strategic capabilities are developed and translated into sustainable innovation outcomes.

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