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Digital Customer-Centric Intimacy Capability and Sustainability-Driven Market Innovation through Digital Business Agility Improve MSME Performance in Digital Transformation Era

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Abstract

Digital technology has changed the competitive ground for Micro, Small and Medium Enterprises (MSMEs) over last few decades but a number of organisations have not been able to deliver consistent performance despite extensive use of digital. This paradox demonstrates that without developing strategic capabilities for value creation and delivery, digitalization alone does not make a huge difference. This study focuses on analyzing the effect of Digital Customer-Centric Intimacy Capability and Sustainability-Driven Market Innovation, towards MSME performance in that gap area but with moderation from Digital Business Agility based Dynamic Capability Theory.
Using a quantitative design, data were collected from 300 MSMEs in Indonesia and then tested using covariance-based Structural Equation Modeling (CB-SEM) by AMOS. The outcome indicates that Digital Customer-Centric Intimacy Capability and Sustainability-Driven Market Innovation mediate significantly positively with MSME performance. And more importantly Digital Business Agility plays a crucial role in improvi ng these relations which highlights the importance of its purpose to empower firms to transform their strategic capabilities into results even under uncertainty through adaptive and thus improving organisational performance, especially anything from things that changing the fundamentals like digital context.
This work adds to existing literature in a unique manner by developing an integrated dynamic capability framework which encapsulates customer intimacy, sustainability-driven innovation and digital agility as endogeneity constructs juxtaposed with one another through both the lens of configurations theory and strategic Management approach focusing on non-tech themes. Further, it characterizes Digital Customer-Centric Intimacy Capability as a unique relational one and re-conceptualises sustainability innovation from being an output to becoming an strategic capability. The research implications and practice are toward the coherence of relational, sustainability as well as agility capabilities for MSMEs to obtain sustainable competitive advantage.

Keywords: *Digital Business Agility; Digital Customer-Centric Intimacy Capability; MSME Performance; Sustainability-Driven Market Innovation.*

Introduction

Digital transformation has significantly changed the competitive landscape by shifting business activities toward digitally connected and customer-oriented ecosystems (Aghazadeh et al., 2024). In this environment, firms are increasingly expected to build closer relationships with customers through digital interaction and personalized value creation rather than relying solely on product features or price competition(Ahmad et al., 2024). These changes are particularly important for Micro, Small, and Medium Enterprises (MSMEs), which operate with limited resources but are required to adapt quickly to dynamic market conditions.In Indonesia, MSMEs contribute more than 61% of Gross Domestic Product and absorb approximately 97% of the national workforce(Sirait et al., 2024). The rapid growth of digital platforms has also encouraged MSMEs to adopt digital technologies in marketing and business operations. However, the increasing use of digital platforms has not always been followed by consistent improvements in business performance(Hasanah et al., 2025). Many MSMEs continue to experience intense price competition, low customer loyalty, and difficulties in maintaining sustainable competitive advantage despite broader digital adoption (Aziz, 2024). Prior studies similarly reported that digital adoption does not automatically generate superior performance outcomes for MSMEs(Affandi et al., 2024). This condition indicates that the success of digital transformation may depend not only on technology adoption itself, but also on the strategic capabilities that support value creation and customer relationship development.

Several previous studies have primarily focused on digital orientation, digital readiness, and IT capability as the main drivers of MSME performance (Abera et al., 2024; Herhausen et al., 2020; Kholifah et al., 2025). Although these capabilities are important, they tend to emphasize operational and technological aspects of digital transformation while giving less attention to relational and strategic capabilities that strengthen long-term customer engagement and value co-creation(Akbar, 2024). As a result, the mechanisms through which MSMEs transform digital adoption into sustainable performance remain insufficiently explained in the existing literature.

To address this issue, this study proposes Digital Customer-Centric Intimacy Capability (DCCIC) as a strategic capability that enables firms to integrate digital technologies with customer insights in order to strengthen personalized interaction and long-term relationships(Liu et al., 2024). Compared with traditional digital marketing approaches that mainly focus on expanding market reach, DCCIC emphasizes the quality and depth of customer relationships as a source of value creation(Tabrani et al., 2018). For MSMEs operating in highly competitive digital markets, stronger customer intimacy may help firms improve customer retention, loyalty, and overall business performance.Besides customer-related capabilities, MSMEs are also facing increasing pressure to align business activities with sustainability goals. The Sustainable Development Goals (SDGs) encourage firms to integrate economic, social, and environmental considerations into their business strategies(Hendratmi et al., 2024). Nevertheless, many MSMEs still encounter difficulties in transforming sustainability orientation into innovative products, services, and market opportunities that create economic value(Al-Hooti et al., 2024). This condition highlights the importance of Sustainability-Driven Market Innovation (SDMI), which refers to a firm's capability to develop market-oriented innovations based on sustainability principles. Previous studies have often positioned sustainability-driven innovation as an outcome variable rather than as a strategic capability that supports competitive advantage and long-term performance(Agnihotri et al., 2023).

In addition, the effectiveness of DCCIC and SDMI may depend on a firm's ability to respond quickly to environmental changes. In dynamic digital markets, firms are required to continuously adjust business processes, reconfigure resources, and respond rapidly to market uncertainty(Hasibuan, 2025). Therefore, Digital Business Agility (DBA) becomes an important organizational capability that enables firms to sense market changes and adapt effectively to changing business conditions(Ahmad et al., 2024). Agile firms are generally more capable of utilizing customer insights, implementing innovation, and responding to competitive pressures in digital environments.

This study is grounded in Dynamic Capability Theory (DCT), which explains that firm performance is influenced by the ability to sense opportunities, seize them, and reconfigure organizational resources in response to environmental change(Teece, 2007). Within this perspective, DCCIC reflects sensing and seizing capabilities through customer understanding and digital interaction, while SDMI represents the capability to create long-term value through sustainability-oriented innovation. DBA, meanwhile, reflects reconfiguring capability that allows firms to adapt operational processes and strategic actions in rapidly changing environments (Teece, 2007).Although studies on digital transformation and dynamic capabilities continue to grow, several important gaps remain. First, prior research has largely concentrated on general digital capabilities, such as digital orientation, digital readiness, and IT capability, while limited attention has been given to customer-centric intimacy capability as a strategic mechanism for value co-creation in digital markets(Abera et al., 2024; Akbar, 2024; Herhausen et al., 2020; Kholifah et al., 2025). Second, sustainability-driven innovation has rarely been examined as a strategic capability that directly contributes to MSME performance in dynamic business environments (Kurniawan et al., 2021). Third, the moderating role of Digital Business Agility in strengthening the relationship between strategic capabilities and MSME performance remains underexplored, particularly in the context of digital transformation among MSMEs.

Based on these gaps, this study aims to develop and empirically examine a comprehensive model explaining the influence of Digital Customer-Centric Intimacy Capability and Sustainability-Driven Market Innovation on MSME performance, as well as the moderating role of Digital Business Agility in these relationships. By integrating customer-centric capability, sustainability-driven innovation, and organizational agility within the framework of Dynamic Capability Theory, this study is expected to contribute both theoretically and practically to the understanding of sustainable MSME performance in the digital transformation era.

Literature Review

Theoretical Basis: Dynamic Capability Theory

Dynamic Capability Theory (DCT) explains that firm performance in dynamic environments depends not only on the possession of resources, but also on a firm's capability to sense opportunities, seize them, and reconfigure organizational resources in response to environmental change(Teece, 2007). This perspective is highly relevant in the context of digital transformation, where firms continuously face rapid technological change, evolving customer expectations, and increasing market competition.

For MSMEs, dynamic capabilities are particularly important because resource limitations often reduce their ability to compete using conventional strategies alone. In digital environments, MSMEs are required to develop strategic capabilities that allow them to interpret market signals, utilize digital technologies effectively, and adapt business processes to changing conditions (Teece, 2007). Therefore, the ability to integrate digital knowledge, customer understanding, and organizational adaptability becomes essential for achieving sustainable business performance.

Within the Dynamic Capability Theory framework, this study conceptualizes Digital Customer-Centric Intimacy Capability (DCCIC), Sustainability-Driven Market Innovation (SDMI), and Digital Business Agility (DBA) as interconnected strategic capabilities representing sensing, seizing, and reconfiguring processes. DCCIC reflects a firm's capability to utilize digital technologies in order to strengthen customer understanding, create personalized digital interactions, enhance relational engagement, and maintain long-term customer relationships. Through these capabilities, firms are able to strengthen customer trust, loyalty, and customer lifetime value in digital markets. Meanwhile, Sustainability-Driven Market Innovation (SDMI) represents a firm's capability to transform sustainability orientation into market-oriented innovation that creates long-term value. Digital Business Agility (DBA), on the other hand, reflects the organizational capability to respond rapidly to market changes, reconfigure resources, and adapt operational processes in uncertain business environments. Collectively, these capabilities enable MSMEs to improve responsiveness,

strengthen competitiveness, and maintain sustainable business performance in the digital transformation era (Teece, 2007).

MSME Performance and Digital Customer-Centric Intimacy Capability

As digital markets become increasingly customer-oriented, firm performance is strongly influenced by the ability to establish meaningful and long-term relationships with customers(Baral et al., 2023). Digital Customer-Centric Intimacy Capability (DCCIC) refers to a firm's strategic capability to utilize digital technologies for understanding customer preferences, creating personalized interactions, and strengthening relational engagement with customers. From the perspective of Dynamic Capability Theory, DCCIC reflects sensing and seizing capabilities that enable firms to identify changing customer needs and respond through adaptive value creation strategies (Teece, 2007). Unlike conventional digital marketing approaches that primarily emphasize market reach and transactional efficiency, DCCIC focuses more on relational value creation through customer understanding, interaction quality, emotional engagement, and relationship continuity in digital environments.

Prior studies indicate that firms with stronger customer-centric capabilities are more likely to achieve superior performance outcomes, particularly in digital markets characterized by intense competition and low switching costs(Andaleeb et al., 2016). For MSMEs, stronger customer relationships can reduce price sensitivity, improve business differentiation, and support long-term customer retention(Fotiadis & Vassiliadis, 2017). In addition, digital interactions that create convenience and strengthen customer relationships may contribute to higher customer loyalty and sustainable business performance. Therefore, DCCIC is expected to positively influence MSME performance.

H1: Digital Customer-Centric Intimacy Capability has a positive effect on MSME performance.

Market Innovation and Performance of MSME Driven by Sustainability

Sustainability has become an increasingly important strategic orientation for firms seeking to maintain competitiveness in dynamic business environments(Prisco et al., 2025). In recent years, sustainability-oriented innovation has received growing attention as firms are encouraged to integrate economic, environmental, and social considerations into business activities and market offerings. For MSMEs, sustainability-driven innovation is not only associated with environmental responsibility, but also with the ability to create long-term value and strengthen market competitiveness.

Sustainability-Driven Market Innovation (SDMI) refers to a firm's capability to develop products, services, and business offerings that integrate sustainability principles with market needs. Within the perspective of Dynamic Capability Theory, SDMI reflects a seizing capability because firms utilize sustainability-related opportunities and transform them into innovative market solutions that create competitive advantage(Teece, 2007). Firms with stronger sustainability-oriented innovation capabilities are generally more capable of adapting to changing customer preferences, environmental regulations, and market expectations.

Previous studies suggest that sustainability-oriented innovation, eco-innovation, and sustainable business model innovation can positively influence firm performance through improved reputation, stronger customer loyalty, operational efficiency, and access to new market opportunities (Abdi et al., 2022). In the context of MSMEs, sustainability-driven innovation also enables firms to differentiate their products and services beyond price-based competition while strengthening long-term business resilience (Prisco et al., 2025). Moreover, firms with stronger sustainability innovation capabilities are often better positioned to respond to increasing market demand for environmentally and socially responsible business practices. Therefore, SDMI is expected to positively influence MSME performance.

H2: Sustainability-Driven Market Innovation has a positive effect on MSME performance.

Digital Business Agility as a Moderating Factor

Although Digital Customer-Centric Intimacy Capability (DCCIC) and Sustainability-Driven Market Innovation (SDMI) are important strategic capabilities, their effectiveness in improving MSME performance may depend on a firm's ability to adapt quickly to dynamic market conditions(Kurniawan et al., 2021). In digital business environments characterized by rapid technological change and shifting customer expectations, firms require organizational agility to effectively transform strategic capabilities into business outcomes. Digital Business Agility (DBA) refers to a firm's capability to rapidly adjust strategies, operational processes, and digital resource configurations in response to market changes and environmental uncertainty(Chong & Zainal, 2024).

From the perspective of Dynamic Capability Theory, DBA represents a reconfiguring capability that enables firms to modify organizational resources and operational processes in order to respond effectively to changing market conditions(Teece, 2016). Firms with higher levels of agility are generally more capable of implementing strategic initiatives, responding to customer feedback, and adapting innovation strategies in real time.

In the context of DCCIC, firms may possess strong customer understanding and relational engagement capabilities, but these capabilities may not produce optimal performance outcomes if the organization lacks the agility to respond quickly to customer needs and market changes(Sagala & Őri, 2025). MSMEs with high DBA are more capable of utilizing customer insights, adjusting digital offerings, personalizing interactions, and responding rapidly to evolving customer expectations. Consequently, the positive effect of DCCIC on MSME performance is expected to become stronger when DBA is high.

The effectiveness of Sustainability-Driven Market Innovation may also depend on organizational agility. Sustainability-oriented innovations often require firms to continuously adapt products, business processes, and market strategies in response to changing environmental standards, customer preferences, and competitive pressures(Al Omoush et al., 2025). Firms with higher DBA are generally more capable of reallocating resources, integrating sustainability initiatives into operational activities, and transforming sustainability-oriented innovation into market opportunities and performance improvements. Agile firms are also better

positioned to introduce sustainability-based products and services that align with evolving market expectations. In contrast, firms with low agility may encounter difficulties in adapting sustainability initiatives to dynamic market conditions, thereby reducing the performance benefits generated from SDMI(Athamneh & Jais, 2023). Without sufficient agility, sustainability efforts may remain limited to operational initiatives without creating significant economic value (Nuseir & Aljumah, 2020). Therefore, DBA is expected to strengthen the positive relationship between SDMI and MSME performance (Enshassi et al., 2025).

H3: Digital Business Agility strengthens the positive effect of Digital Customer-Centric Intimacy Capability on MSME performance.

H4: Digital Business Agility strengthens the positive effect of Sustainability-Driven Market Innovation on MSME performance.

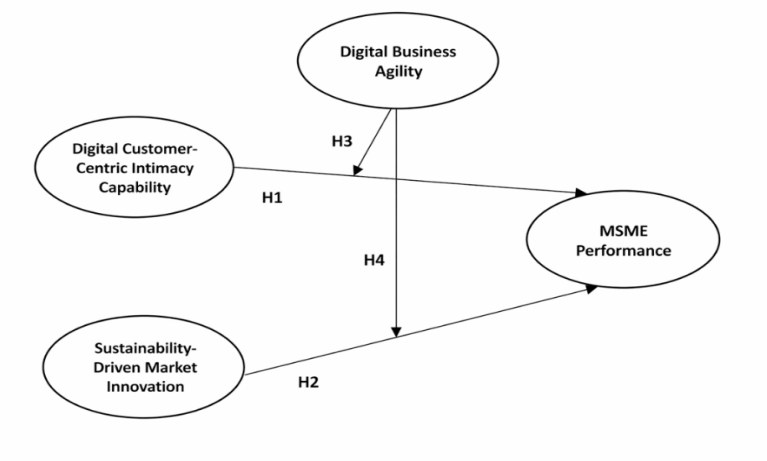


Figure 1. Research Model

We build our conceptual model of this study leveraging the Dynamic Capability Theory (DCT), highlighting how organizational capabilities affect firm performance in dynamic environments. In fact, this research contributes to a multi-view of performance improvement in MSME digital transformation era by incorporating customer-based, sustainable and agile perspectives. Digital Customer-Centric Intimacy Capability (DCCIC) and Sustainability-Driven Market Innovation (SDMI), as central forces of the model, are identified to enable MSME performance through strategic capabilities. DCCIC represents the firm's capacity to sense and respond to shifting customer needs through digitally enabled interactions, thus enhancing relational value and customer engagement. The other side SDMI reflects firm potential to capitalise sustainability opportunities into the great proposition combined with inherent propensity of cash flow from sustainable domains & season new, sustainable values.

However, the model does not assume that these capabilities auto-magically predict behaviour improvement. Given the changing market dynamics, it works on the principle that DCCIC and SDMI — work only if firm reconfigures its resources. As a moderating variable, the same effect on MSME performance is amplified by Digital Business Agility (DBA). DBA is the flexibility and ability of an organization to re-organize itself in terms of strategies, processes and use of digital assets faster. More agile firms are equipped to translate their customers experiences into operational tactics and execute, sustainablity-led innovations with higher success. Firms with a lower adaptive capability, on the other hand, may find it difficult to adopt and deploy all these capabilities leading to sub-optimal performance. In line with this, Based on this conceptual model presumes that actual MSME performance antecedents of DCCIC and SDMI however its level of Digital Business Agility decides how By this guidance organisations must align between required capabilities for sensing, seizing and reconfiguration to keep sustainable performance in the increasingly complex digital markets.

Method

Research Design

This study employs a quantitative research approach to examine the hypothesized relationships among Digital Customer-Centric Intimacy Capability (DCCIC), Sustainability-Driven Market Innovation (SDMI), Digital Business Agility (DBA), and MSME performance. Primary data were collected through a cross-sectional survey involving MSMEs in Indonesia(Hair et al., 2022). Because the proposed research model is theory-driven and involves multiple latent constructs with simultaneous relationships, this study applies covariance-based Structural Equation Modeling (CB-SEM) using AMOS to evaluate both the measurement model and the structural model. CB-SEM is considered appropriate for theory testing and model confirmation in studies with established theoretical foundations(Hair & Sarstedt, 2019).

Population and Sample

The population of this study consists of MSMEs in Indonesia that have adopted digital technologies in their business activities. This study applies a purposive sampling technique to ensure that respondents possess characteristics relevant to the research objectives. The sampling criteria include: (1) MSMEs that have operated for at least two years, and (2) MSMEs that actively utilize digital platforms, such as social media, marketplaces, or digital business systems, in their operational and marketing activities.

The respondents in this study were MSME owners or managers who were directly involved in business decision-making and digital business activities. Data were collected from MSMEs operating across various sectors, including culinary, fashion, retail, creative industries, beauty and aesthetic services, and other service-based businesses. The respondents were located in several regions of Indonesia, with offline questionnaire distribution conducted primarily in Java and Bali, while online distribution enabled broader participation from MSMEs in other regions.

The questionnaires were distributed using both offline and online approaches. Offline distribution was conducted through direct visits and MSME business communities, while online questionnaires were distributed using Google Forms through social media platforms and business networks. Data collection was conducted over a six-month period from October 2025 to March 2026.

The sample size was determined based on the minimum recommendation for Structural Equation Modeling (SEM), which suggests approximately 5–10 observations for each measurement indicator (Hair & Sarstedt, 2019). Since this study employs 29 measurement items, the recommended sample size ranges from 145 to 290 respondents. To improve model stability and statistical power, this study collected data from 300 MSMEs.

Measurement of Variables

All constructs were measured through multi-item scales adapted from previous studies using a five-point Likert scale that ranged from 1 (strongly disagree) to 5 (strongly agree)(Hair et al., 2022).

Construct	Code	Measurement Item
Digital Customer-Centric Intimacy Capability (DCCIC)	DCCIC1	Digital platforms enable us to create a sense of closeness with customers
	DCCIC2	Digital interactions strengthen emotional connections with customers
	DCCIC3	Customers feel mutually dependent on our business through digital interactions
	DCCIC4	Our digital services are relevant to customer needs
	DCCIC5	Digital interactions enhance emotional engagement with customers
	DCCIC6	Customers perceive a strong relationship with our business digitally
	DCCIC7	Digital platforms provide convenience that strengthens customer relationships
	DCCIC8	Customers feel emotionally connected through digital convenience
	DCCIC9	Digital convenience fosters long-term relationships with customers Adoption from (Hasibuan et al., 2026)
Sustainability-Driven Market Innovation (SDMI)	SDMI1	Our business develops environmentally friendly products/services
	SDMI2	We implement sustainable processes in our operations
	SDMI3	We differentiate our products based on sustainability values
	SDMI4	Our offerings provide sustainability value to customers
	SDMI5	Customers respond positively to our sustainability-based innovations
	SDMI6	Our sustainability initiatives create long-term market value Adoption from(Prisco et al., 2025)
Digital Business Agility (DBA)	DBA1	Our business can make decisions quickly using digital data
	DBA2	Our operations are flexible through digital technologies
	DBA3	We can rapidly reconfigure digital resources
	DBA4	We respond quickly to market changes
	DBA5	We experiment with new digital initiatives
	DBA6	We can scale digital innovations efficiently Adoption from(Ahmad et al., 2024; Teece, 2018)
MSME Performance	MSMEP1	Our business revenue has increased
	MSMEP2	Our profitability has improved
	MSMEP3	Our market share has grown
	MSMEP4	Customer retention has increased
	MSMEP5	Operational efficiency has improved
	MSMEP6	Our business processes are more flexible
	MSMEP7	We innovate faster than before
	MSMEP8	Our innovations are successful in the market Adoption from(Baral et al., 2023; Gao et al., 2023)

Table 1. presents the detailed measurement indicators
Source: At Work, 2026

Data Analysis Technique

This study employed covariance-based Structural Equation Modeling (CB-SEM) using AMOS to evaluate both the measurement model and the structural model(Hair & Sarstedt, 2019). CB-SEM was considered appropriate because this study aimed to test a theory-driven model involving multiple latent constructs and hypothesized relationships simultaneously.

The data analysis process was conducted in several stages. First, preliminary data screening was performed to examine missing values, detect potential outliers, and assess data normality. Missing data were checked to ensure completeness of responses, while outlier detection was conducted using standardized residuals and Mahalanobis distance. Normality assessment included the examination of skewness and kurtosis values.

Second, Confirmatory Factor Analysis (CFA) was conducted to evaluate the measurement model. Construct reliability and convergent validity were assessed using factor loadings, Composite Reliability (CR), and Average Variance Extracted (AVE). Factor loadings and CR values above 0.70 and AVE values above 0.50 were considered acceptable indicators of reliability and convergent validity.

Discriminant validity was evaluated using the Heterotrait-Monotrait ratio of correlations (HTMT). Although HTMT is more commonly associated with Partial Least Squares Structural Equation Modeling (PLS-SEM), recent methodological studies suggest that HTMT can also provide a robust assessment of discriminant validity within covariance-based SEM approaches(Hair et al., 2022).

Third, the structural model was evaluated by examining model fit indices, including Chi-square, Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA). Hypothesis testing was conducted through path coefficient analysis and significance testing. The coefficient of determination (R^2) was also examined to evaluate the explanatory power of the model.

Finally, moderation analysis was performed using interaction terms to examine the moderating role of Digital Business Agility in the relationships between Digital Customer-Centric Intimacy Capability, Sustainability-Driven Market Innovation, and MSME performance.

Common Method Bias

To minimize the potential influence of common method bias (CMB), both procedural and statistical remedies were applied in this study. Procedurally, respondents were assured of anonymity and confidentiality to reduce evaluation apprehension and response bias.

Statistically, Harman's single-factor test was conducted by loading all measurement items into an exploratory factor analysis. The results showed that the first factor accounted for 38.4% of the total variance, which was below the recommended threshold of 50%, indicating that common method bias was not a serious concern.

In addition, full collinearity assessment was performed using Variance Inflation Factor (VIF) values. The results indicated that all VIF values ranged from 1.842 to 2.615, which were below the recommended threshold of 3.3, suggesting that common method bias and multicollinearity issues were unlikely to affect the results significantly.

Result and Discussion

Result

Respondent Profile

Deconstructing who respondents are, is not an descriptive exercise but a major step to the object for helping establish empirical relevance for the entire study. The respondents profile informs whether sampled MSMEs reflect the digital transformation dynamics — exposure to digital technologies, market competition and intensity of customer interaction. The respondents of this research are chosen from MSME that perform digital business. Hence the results can be relevant as it reflect the true execution condition. Moreover, tracking by demographic and business features provides a logical more effective approach to understand how digital capabilities are produced correctly and used across MSMEs-sectional environments. An overview of the characteristics of respondents (the table below).

Characteristics	Category	Frequency	Percentage (%)
Gender	Male	168	56.0
	Female	132	44.0
Age	< 25 years	42	14.0
	25 – 34 years	96	32.0
	35 – 44 years	87	29.0
	≥ 45 years	75	25.0
Business Experience	2 – 5 years	108	36.0
	6 – 10 years	102	34.0
	> 10 years	90	30.0
Business Sector	Trade	96	32.0
	Manufacturing	63	21.0
	Services	87	29.0
	Others	54	18.0

Table 2. Demographic Characteristics of Respondents
Source: Process Data, 2026

This means that most of the MSME sampled are run by those aged 25 to 44 years, which is arguably referred to as those more than capable/ otherwise adaptable in utilising digital technologies and thus a lot more open towards innovation. This composition supports a further examination of digital capabilities, as this demographic responds more often in relation to engagement in the digital space. In addition, The Verb of the nature aspect ditracens and probably almost all MSMEs are in the state of preparing to grow (growing) and even tigger to consolidate which indicates that you want an active course of competitiveness improvements. Even more, the predominance of trade and service sectors suggests that respondents work in environments where customer interaction and market responsiveness are key; hence, capabilities that emphasize customer-centricity and agility are particularly relevant. In general, the respondent profile indicates that the sample is largely well-aligned with the purpose of the study and in particular identifies MSMEs operating in markets characterised by moderate to high digitisation and market dynamism as found across highly competitive business sectors.

Measurement Model Evaluation

The evaluation of the measurement model is essential to ensure that the constructs used in this study adequately represent the theoretical concepts being examined. Before assessing the structural relationships, it is necessary to confirm that each construct demonstrates sufficient reliability and validity. Confirmatory Factor Analysis (CFA) was conducted to assess indicator reliability, internal consistency, and convergent validity. This process ensures that all latent constructs are empirically supported and that the observed indicators appropriately reflect their respective theoretical dimensions.

Table 3 presents the results of the measurement model evaluation, including factor loadings, Cronbach's Alpha, Composite Reliability (CR), and Average Variance Extracted (AVE). All factor loadings exceeded the recommended threshold of 0.70, indicating satisfactory indicator reliability. Cronbach's Alpha and Composite Reliability values for all constructs were above 0.70, confirming strong internal consistency reliability. In addition, all AVE values exceeded 0.50, supporting convergent validity.

Construct	Item	Loading	Cronbach's Alpha	CR	AVE
Digital Customer-Centric Intimacy Capability	DCCIC1	0.812	0.941	0.947	0.665
	DCCIC2	0.845			
	DCCIC3	0.801			
	DCCIC4	0.829			
	DCCIC5	0.854			
	DCCIC6	0.823			
	DCCIC7	0.798			
	DCCIC8	0.816			
	DCCIC9	0.807			
Sustainability-Driven Market Innovation	SDMI1	0.834	0.913	0.921	0.661
	SDMI2	0.846			
	SDMI3	0.802			
	SDMI4	0.819			
	SDMI5	0.831			
	SDMI6	0.788			
Digital Business Agility	DBA1	0.821	0.907	0.915	0.642
	DBA2	0.833			
	DBA3	0.802			
	DBA4	0.815			
	DBA5	0.774			
	DBA6	0.792			
MSME Performance	MSMEP1	0.826	0.928	0.934	0.640
	MSMEP2	0.842			
	MSMEP3	0.801			
	MSMEP4	0.817			
	MSMEP5	0.793			
	MSMEP6	0.784			
	MSMEP7	0.829			
	MSMEP8	0.812			

Table 3. Measurement Model Results
Source: Process Data, 2026

The results indicate that all indicators reliably represent their respective constructs. Although the DCCIC construct demonstrated a relatively high Composite Reliability value, the indicators were retained because they capture several complementary aspects of customer-centric intimacy capability, including relational engagement, digital responsiveness, customer convenience, and emotional connection in digital interactions. Therefore, the construct was not treated solely as emotional intimacy, but as a broader strategic capability that reflects how MSMEs build and maintain customer relationships through digital platforms.

Furthermore, no measurement items were removed during the CFA process because all indicators met the recommended loading criteria and contributed meaningfully to construct validity. The findings suggest that the operationalization of DCCIC, SDMI, DBA, and MSME Performance is empirically reliable and theoretically consistent with the Dynamic Capability perspective adopted in this study.

Discriminant Validity

Discriminant validity is an important assessment because it tests whether each construct can measure a unique theoretical domain and only that appropriate ground alternative variables in the model. In this study, the Heterotrait-Monotrait Ratio (HTMT) was employed to assess discriminant validity which is deemed to be a more robust and sound method than for instance cross-loadings. Demonstrating discriminant validity for this research is crucial because the constructs themselves—customer intimacy, sustainability driven innovation and business agility—are conceptually related and are likely to possess at least some level of overlap. Proper discriminant validity ensures that each construct contributes independently to MSME performance. That is the reason you must run HTMT analysis that is required because constructs are expected to be distinguishable through HTMT analysis. We summarize the results in the following table.

Construct	DCCIC	SDMI	DBA	MSME Performance
DCCIC	-	0.721	0.695	0.742
SDMI		-	0.708	0.735
DBA			-	0.756
MSME Performance				-

Table 4. HTMT Results
Source: Process Data, 2026

All HTMT values are below the acceptable threshold of < 0.90, supporting strong discriminant validity formalized. Consequently, this result confirms that even though the constructs share a theoretical relationship, they are distinct and do not exhibit any undesirable overlap. What this translates into practice: MSMEs now are grouped into silos, silo based on what they see as nurturing relationship with customers through sustainability-driven innovation versus pivoting away from doing business to sustaining it back again — an experience that must contain three different strategic efforts. This is an interesting point (not trivial) as it validates the fact that digital transformation involves different capabilities. Thus, the model incorporates each construct's distinctive incremental effect on MSME performance without any redundancy or conceptual overlap.

Model Fit Evaluation

Model fit evaluation was conducted to assess the extent to which the proposed theoretical model fits the observed data. A satisfactory model fit indicates that the hypothesized relationships among constructs are empirically supported and adequately represent the observed covariance structure. In this study, multiple goodness-of-fit indices were used to provide a comprehensive assessment of model fit, including absolute fit, incremental fit, and parsimonious fit indices.

Fit Index	Value	Recommended Threshold	Result
Chi-square	365.891	Smaller is better	Good
Probability	0.824	> 0.05	Good
CMIN/DF	0.933	< 3.00	Good
CFI	1.000	> 0.90	Good
TLI	0.987	> 0.90	Good
RMSEA	0.000	< 0.08	Good
SRMR	0.041	< 0.08	Good
GFI	0.921	> 0.90	Good
AGFI	0.913	> 0.90	Good

Table 5. Goodness-of-Fit Index
Source: Process Data, 2026

The results indicate that the proposed model demonstrates an acceptable overall fit with the observed data. All major goodness-of-fit indices met the recommended threshold values, suggesting that the structural model adequately represents the relationships among Digital Customer-Centric Intimacy Capability, Sustainability-Driven Market Innovation, Digital Business Agility, and MSME Performance.

The high values of CFI and TLI, together with the low RMSEA and SRMR values, indicate that the model possesses strong explanatory capability while maintaining acceptable model parsimony. These findings support the suitability of the proposed framework within the Dynamic Capability Theory perspective and provide a sufficient basis for subsequent structural model and hypothesis testing.

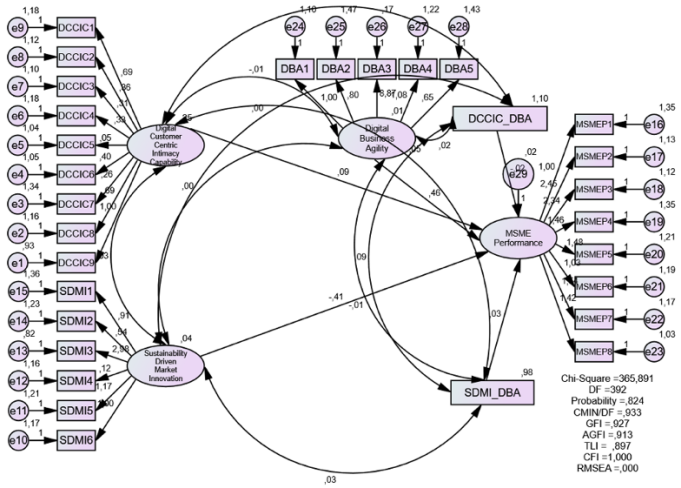


Figure 2. Structure Model

Structural Model and Hypothesis Testing

Structural model analysis was conducted to examine the hypothesized relationships among the constructs within the proposed research framework. This analysis evaluates whether Digital Customer-Centric Intimacy Capability (DCCIC) and Sustainability-Driven Market Innovation (SDMI) significantly influence MSME Performance. The results of the hypothesis testing are presented in Table 6.

Hypothesis	Path	β	SE	CR	p-value	95% CI	Result
H1	Digital Customer-Centric Intimacy Capability has a positive effect on MSME performance	0.312	0.064	4.876	0.000	(0.187, 0.437)	Supported
H2	Sustainability-Driven Market Innovation has a positive effect on MSME performance	0.298	0.071	4.215	0.000	(0.159, 0.437)	Supported

Table 6. Hypothesis Testing Results
Source: Process Data, 2026

The findings indicate that Digital Customer-Centric Intimacy Capability has a positive and significant effect on MSME Performance. This result suggests that MSMEs capable of developing stronger customer-oriented digital interactions, personalized services, and relational engagement are more likely to achieve improved business performance. The significant relationship also confirms the importance of customer-centric digital capabilities in increasingly competitive digital business environments.

The results further show that Sustainability-Driven Market Innovation positively influences MSME Performance. MSMEs that integrate sustainability principles into products, services, and market offerings tend to strengthen competitiveness and create greater business value. This finding indicates that sustainability-oriented innovation can function as an important strategic capability for improving organizational performance.

Explanatory Power and Effect Size

To further evaluate the explanatory capability of the proposed model, the coefficient of determination (R^2), adjusted R^2, and effect size (f^2) were assessed. The results are presented in Table 7.

Variable	R^2	Adjusted R^2	Effect Size (f^2)	Interpretation
MSME Performance	0.548	0.541	—	Moderate
DCCIC to MSME Performance	—	—	0.162	Medium
SDMI to MSME Performance	—	—	0.148	Medium

Table 7. Coefficient of Determination and Effect Size
Source: Process Data, 2026

The R^2 value indicates that the proposed model explains 54.8% of the variance in MSME Performance, demonstrating moderate explanatory power. This suggests that DCCIC and SDMI jointly contribute substantially to explaining MSME performance within the context of digital transformation.

Furthermore, the effect size analysis shows that both DCCIC and SDMI have meaningful contributions to MSME Performance. The results indicate that customer-centric digital capability and sustainability-driven innovation represent important strategic capabilities that support MSME competitiveness and organizational outcomes.

Moderating Effect of Digital Business Agility

Moderation analysis was conducted to examine whether Digital Business Agility (DBA) strengthens the relationships between DCCIC, SDMI, and MSME Performance. The product indicator approach was employed in AMOS to test the moderating effects. Prior to generating the interaction terms, all indicators were mean-centered to minimize potential multicollinearity between predictor and moderator variables.

Hypothesis	Interaction Path	β	SE	CR	p-value	95% CI	Result
H3	Digital Business Agility positively moderates the relationship between Digital Customer-Centric Intimacy Capability and MSME performance	0.184	0.059	3.102	0.002	(0.068, 0.300)	Supported
H4	Digital Business Agility positively moderates the relationship between Sustainability-Driven Market Innovation and MSME performance	0.167	0.058	2.874	0.004	(0.053, 0.281)	Supported

Table 8. Moderation Results
Source: Process Data, 2026

The results demonstrate that Digital Business Agility significantly strengthens the positive effects of DCCIC and SDMI on MSME Performance. MSMEs with higher agility are more capable of rapidly utilizing customer insights, adapting operational processes, and implementing sustainability-oriented innovations in response to changing market conditions.

In contrast, MSMEs with lower agility may experience difficulties in transforming customer-centric capabilities and sustainability-oriented innovations into improved performance outcomes due to slower organizational responses and limited flexibility. These findings confirm the important role of DBA as an enabling capability that enhances the effectiveness of strategic capabilities in dynamic digital environments.

Simple slope analysis further indicates that the positive relationships between DCCIC and MSME Performance, as well as between SDMI and MSME Performance, become stronger at higher levels of DBA. This finding reinforces the moderating role of agility in strengthening MSME competitiveness and organizational performance.

Discussion

Digital Customer-Centric Intimacy Capability has a positive effect on MSME performance

The findings confirm that Digital Customer-Centric Intimacy Capability (DCCIC) positively influences MSME Performance. This result indicates that the ability of MSMEs to build close, personalized, and continuous digital relationships with customers has become increasingly important in highly competitive digital markets. Within the perspective of Dynamic Capability Theory, DCCIC reflects sensing and seizing capabilities that enable firms to understand changing customer preferences and respond through relevant digital interactions and customized value creation.This finding is consistent with prior studies emphasizing the importance of customer-oriented strategies in improving organizational performance and strengthening competitive advantage in digital environments(Andaleeb et al., 2016; Fotiadis & Vassiliadis, 2017). The result also reinforces previous arguments that digital adoption alone is insufficient to improve business performance without strong relational capabilities that support long-term customer engagement(Affandi et al., 2024; Herhausen et al., 2020). However, this study extends prior research by positioning DCCIC as a specific strategic capability that emphasizes relational value creation rather than merely expanding digital visibility or transactional reach(Akbar, 2024; Liu et al., 2024).

The importance of DCCIC becomes particularly relevant in the context of Indonesian MSMEs, where firms generally operate under limited financial, technological, and human resource capacities. Under these conditions, maintaining existing customers is often more efficient than continuously acquiring new customers through costly digital advertising and promotional activities. Strong digital intimacy enables MSMEs to develop closer customer relationships, encourage repeat purchases, and strengthen customer loyalty, which are essential for sustaining business performance in increasingly saturated digital marketplaces.

In addition, Indonesian MSMEs frequently compete in environments characterized by low switching costs, where customers can easily move to competing sellers offering similar products or prices. As a result, relational engagement through personalized communication, responsive digital interaction, and customer-oriented services becomes an important differentiating factor. MSMEs capable of creating stronger emotional and relational connections with customers are more likely to maintain customer retention and generate sustainable business value over time.

From a practical perspective, these findings suggest that MSMEs should not focus solely on increasing digital presence or transactional activities. Instead, MSMEs need to develop digital strategies that prioritize customer engagement, personalized interaction, responsiveness, and long-term relationship development. In dynamic digital markets, customer intimacy represents not only a marketing approach but also a strategic capability that contributes directly to organizational competitiveness and performance sustainability.

Sustainability-Driven Market Innovation has a positive effect on MSME performance

The findings demonstrate that Sustainability-Driven Market Innovation (SDMI) positively influences MSME Performance. This result indicates that MSMEs capable of integrating sustainability principles into products, services, and market offerings are more likely to achieve stronger competitiveness and improved business outcomes. Within the Dynamic Capability Theory perspective, SDMI reflects a seizing capability that enables firms to identify sustainability-related market opportunities and transform them into innovative value propositions. This finding is consistent with previous studies suggesting that sustainability has evolved beyond ethical responsibility and increasingly functions as a strategic capability that supports organizational competitiveness and long-term business performance(Abdi et al., 2022; Prisco et al., 2025). The present study further extends prior research by emphasizing that sustainability-driven innovation is not limited to large corporations but is also highly relevant for MSMEs operating in dynamic and digitally connected markets(Agnihotri et al., 2023; Al-Hooti et al., 2024).

In the context of Indonesian MSMEs, SDMI can be reflected through various practical forms of innovation. MSMEs may adopt environmentally friendly packaging, utilize recyclable materials, implement energy-efficient production processes, reduce production waste, or develop products based on sustainable local resources. In addition, some MSMEs increasingly communicate transparency regarding raw materials, production practices, and social responsibility through digital platforms in order to strengthen customer trust and market differentiation.

These sustainability-oriented practices allow MSMEs to move beyond price-based competition and create additional value that is increasingly appreciated by modern consumers. In digital markets where consumers have easier access to product information and alternative sellers, sustainability attributes can strengthen brand image, customer trust, and purchasing preference. MSMEs capable of combining sustainability values with product innovation are therefore more likely to attract environmentally and socially conscious consumers while simultaneously improving long-term competitiveness.

The findings also suggest that sustainability should not be viewed merely as regulatory compliance or additional operational burden. Instead, sustainability-oriented innovation can become a strategic mechanism for developing differentiated products, strengthening market positioning, and expanding access to new customer segments. For MSMEs with limited resources, integrating sustainability into business models may also help improve operational efficiency, enhance customer loyalty, and generate stronger market value in increasingly competitive digital business environments.

The Moderating Role of Digital Business Agility

The findings demonstrate that Digital Business Agility (DBA) significantly strengthens the positive effects of Digital Customer-Centric Intimacy Capability (DCCIC) and Sustainability-Driven Market Innovation (SDMI) on MSME Performance. This result indicates that the effectiveness of customer-oriented and sustainability-driven strategic capabilities depends not only on their existence, but also on the firm's ability to rapidly adapt, reconfigure resources, and respond to changing market conditions. From the perspective of Dynamic Capability Theory, DBA reflects a reconfiguring capability that enables firms to transform strategic initiatives into actual organizational outcomes under dynamic business environments(Teece, 2016). This finding is consistent with previous studies suggesting that organizational agility improves responsiveness and supports firms in adapting to environmental uncertainty(Ahmad et al., 2024; Chong & Zainal, 2024). However, this study extends prior literature by emphasizing that DBA should not be viewed merely as a direct determinant of performance, but rather as a capability amplifier that strengthens the conversion of strategic capabilities into business performance outcomes(Kurniawan et al., 2021; Sagala & Őri, 2025).

This finding represents one of the main contributions of the study. While prior research has largely examined agility as an independent predictor of organizational performance, the present study demonstrates that agility plays a contingent and enabling role in maximizing the effectiveness of DCCIC and SDMI. In other words, customer intimacy and sustainability-oriented innovation may not generate optimal performance outcomes unless MSMEs possess sufficient agility to implement, adapt, and operationalize these capabilities in rapidly changing digital markets.

In the context of Indonesian MSMEs, this role of agility becomes highly important because many firms operate in uncertain business environments characterized by fluctuating consumer preferences, intense digital competition, and rapid technological change. MSMEs with high DBA are more capable of utilizing customer insights quickly, modifying products and services, adjusting digital operations, and implementing sustainability-oriented innovations in response to evolving market demands. Conversely, MSMEs with lower agility may experience difficulties in translating strategic initiatives into measurable business outcomes due to slower decision-making processes and limited operational flexibility.

From a managerial perspective, these findings imply that MSMEs should not focus solely on developing customer-centric or sustainability-oriented strategies. Firms also need to strengthen organizational agility through faster decision-making, flexible digital operations, adaptive resource allocation, and responsive business processes. In dynamic digital ecosystems, agility functions as a strategic enabler that determines whether customer intimacy and sustainability innovation can be effectively transformed into sustainable business performance.

Conclusion

This study examines the effects of Digital Customer-Centric Intimacy Capability (DCCIC) and Sustainability-Driven Market Innovation (SDMI) on MSME Performance, as well as the moderating role of Digital Business Agility (DBA) within the framework of Dynamic Capability Theory. The findings demonstrate that both DCCIC and SDMI positively influence MSME performance. MSMEs that are capable of building stronger customer relationships through digital interactions and implementing sustainability-oriented innovations tend to achieve better organizational outcomes. The results also confirm that DBA strengthens the effects of DCCIC and SDMI on performance, indicating that organizational agility plays an important role in enhancing the effectiveness of strategic capabilities.

This study contributes to the literature by integrating customer-centric intimacy capability, sustainability-driven innovation, and digital business agility into a single framework for explaining MSME performance. The findings extend Dynamic Capability Theory by demonstrating that DBA functions not merely as a direct predictor of performance, but as a capability amplifier that strengthens the conversion of strategic capabilities into business outcomes. In addition, this study contributes by positioning sustainability-driven innovation as a strategic capability rather than solely as an organizational outcome, while emphasizing the importance of relational digital capabilities in creating customer value within MSMEs.

From a practical perspective, the findings suggest that MSMEs should not focus solely on expanding digital presence or increasing online transactions. Instead, MSMEs need to strengthen customer-oriented digital interactions, develop sustainability-based innovations, and improve organizational agility simultaneously. Customer personalization, responsive digital services, environmentally friendly business practices, and flexible operational processes may help MSMEs improve customer retention, differentiation, and long-term business performance in increasingly competitive markets.

Theoretical Implications

This study contributes to the development of Dynamic Capability Theory by integrating Digital Customer-Centric Intimacy Capability, Sustainability-Driven Market Innovation, and Digital Business Agility into a unified framework explaining MSME performance. The study emphasizes that digital capabilities should not be understood merely in terms of technological adoption, but also through relational capabilities that enable firms to build stronger customer engagement and long-term value creation.

In addition, this study contributes by conceptualizing Sustainability-Driven Market Innovation as a strategic capability that supports firms in transforming sustainability orientation into marketable innovations and competitive advantage. The findings also highlight the role of Digital Business Agility as a contingent capability that strengthens the effectiveness of customer intimacy and sustainability-oriented innovation in improving organizational performance. Therefore, this study provides a broader understanding of how sensing, seizing, and reconfiguring capabilities interact within MSMEs operating in dynamic business environments.

Practical Implications

The findings provide several important implications for MSME practitioners. First, MSMEs should prioritize customer-oriented digital strategies by strengthening personalized interactions, customer engagement, and long-term relationship development rather than relying solely on short-term promotional activities. Building closer digital relationships with customers may help MSMEs reduce customer acquisition costs, improve repeat purchases, and strengthen customer loyalty.

Second, MSMEs should position sustainability as part of their business strategy rather than merely as a compliance requirement. Sustainability-oriented initiatives such as environmentally friendly packaging, efficient resource utilization, transparent sourcing, and sustainable product differentiation may improve customer perception and create stronger market positioning.

Third, MSMEs need to improve Digital Business Agility by developing faster decision-making processes, flexible digital operations, and adaptive organizational practices. Organizational agility enables MSMEs to respond more effectively to market changes, customer preferences, and competitive pressures, thereby strengthening the implementation of customer-centric and sustainability-oriented strategies.

Limitations and Future Research

This study has several limitations that should be considered when interpreting the findings. First, the study employed a cross-sectional design, which limits the ability to capture changes in organizational capabilities and performance over time. Second, the use of purposive sampling may restrict the generalizability of the findings beyond MSMEs with similar characteristics. Third, the heterogeneous nature of MSME sectors in Indonesia may produce different organizational behaviors and capability configurations across industries. Fourth, MSME performance was measured using self-reported perceptions, which may introduce subjectivity and potential response bias. Although procedural and statistical remedies were implemented to minimize common method bias, the possibility of common method variance cannot be entirely eliminated.

Future research may address these limitations by employing longitudinal designs to better examine capability development over time. Further studies may also utilize objective performance indicators, multi-source data, or multi-country comparisons to strengthen external validity. In addition, future researchers are encouraged to conduct multigroup analyses across business sectors, firm sizes, or regional contexts in order to better understand the varying effects of customer-centric intimacy, sustainability-driven innovation, and digital business agility on organizational performance.

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