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DIGITAL COMPETENCE TRANSFORMATION FOR MSME ADAPTATION TOWARD CONSUMER BEHAVIOR DISRUPTION IN BANDA ACEH

Aida Fitri[1*]
Departemen of Entrepreneur, Universitas Muhammadiyah Aceh, Banda Aceh, Indonesia,
Aida.fitri@unmuha.ac.id
**Corresponding author*

Muhammad Jaka Wirata[2]
Departemen of Entrepreneur, Universitas Muhammadiyah Aceh, Banda Aceh, Indonesia,
Muhammad.jaka@unmuha.ac.id

Aidila Sukma[2]
Departemen of Entrepreneur, Universitas Muhammadiyah Aceh, Banda Aceh, Indonesia,
Aidila.sukma@gmail.com

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Abstract
Background – *The rapid development of digital technology and changes in consumer behavior have encouraged MSMEs to adapt quickly through strengthening digital competencies. Previous studies have generally focused on the effect of digital competence on business performance; however, limited research explains how digital competence transformation supports MSME adaptive capability in responding to consumer behavior disruption, particularly in the context of MSMEs in Banda Aceh. In addition, the mediating role of business performance in this relationship remains underexplored. Therefore, this study addresses the research gap by examining the effect of digital competence transformation on MSME adaptive capability through business performance based on the Dynamic Capabilities Theory*
Aim – *This study aims to analyze the effect of digital competence transformation on MSME adaptive capability, with business performance serving as a mediating variable.*
Design / methodology / approach – *This study employed a quantitative approach involving 300 MSMEs in Banda Aceh selected through simple random sampling. Data were collected using structured questionnaires and analyzed using Structural Equation Modeling–Partial Least Squares (SEM-PLS).*
Findings – *The results indicate that digital competence transformation has a positive and significant effect on both business performance and MSME adaptive capability. Business performance was also found to significantly mediate the relationship between digital competence transformation and adaptive capability.*
Conclusion – *Digital competence transformation plays an important role in improving MSME performance and strengthening adaptive capability in responding to consumer behavior disruption. These findings support the Dynamic Capabilities Theory.*
Research implication – *This study highlights the importance of strengthening digital competencies and adaptive business strategies through training programs and policy support to enhance MSME competitiveness.*
Limitations – *This study is limited to MSMEs in Banda Aceh and uses a quantitative approach; therefore, the findings may not be fully generalized to other contexts.*

Keyword : *Digital Competence Transformation; MSMEs; Adaptive Capability; Consumer Behaviour Disruption; Business Performance*

Abstrak

Latar Belakang - Perkembangan teknologi digital dan perubahan perilaku konsumen mendorong UMKM untuk beradaptasi secara cepat melalui penguatan kompetensi digital. Berbagai penelitian sebelumnya umumnya berfokus pada pengaruh kompetensi digital terhadap kinerja usaha, namun masih terbatas yang menjelaskan bagaimana transformasi kompetensi digital membantu kemampuan adaptasi UMKM dalam menghadapi disrupsi perilaku konsumen, khususnya pada konteks UMKM di Banda Aceh. Selain itu, peran kinerja usaha sebagai variabel mediasi dalam hubungan tersebut masih jarang diteliti. Oleh karena itu, penelitian ini mengisi kesenjangan penelitian dengan menguji peran transformasi kompetensi digital terhadap kemampuan adaptasi UMKM melalui kinerja usaha berdasarkan perspektif *Dynamic Capabilities Theory*.

Tujuan - Penelitian bertujuan menganalisis pengaruh transformasi kompetensi digital terhadap kemampuan adaptasi UMKM, dengan kinerja usaha sebagai variabel mediasi.

Desain / metodologi / pendekatan - Penelitian menggunakan pendekatan kuantitatif terhadap 300 UMKM di Banda Aceh melalui simple random sampling. Data dikumpulkan menggunakan kuesioner dan dianalisis menggunakan SEM-PLS.

Temuan - Hasil penelitian menunjukkan bahwa transformasi kompetensi digital berpengaruh positif dan signifikan terhadap kinerja usaha dan kemampuan adaptasi UMKM. Kinerja usaha juga terbukti memediasi hubungan antara kompetensi digital dan kemampuan adaptasi.

Kesimpulan - Transformasi kompetensi digital menjadi faktor penting dalam meningkatkan kinerja dan kemampuan adaptasi UMKM terhadap perubahan perilaku konsumen. Temuan ini memperkuat *Dynamic Capabilities Theory*.

Implikasi penelitian - Penelitian ini menekankan pentingnya penguatan kompetensi digital dan strategi bisnis adaptif melalui pelatihan serta dukungan kebijakan guna meningkatkan daya saing UMKM.

Batasan penelitian - Penelitian terbatas pada UMKM di Banda Aceh dan menggunakan pendekatan kuantitatif sehingga hasil penelitian belum sepenuhnya dapat digeneralisasikan.

Kata kunci: Transformasi Kompetensi Digital; UMKM; Kemampuan Adaptasi; Disrupsi Perilaku Konsumen; Kinerja Usaha

INTRODUCTION

The rapid advancement of digital technology has significantly changed the way businesses interact with consumers. In recent years, consumer behavior has shifted toward digital-based activities, including online shopping, social media engagement, and cashless transactions. Consumers now expect faster responses, personalized services, and easier access to products and information through digital platforms. These changes create major challenges for Micro, Small, and Medium Enterprises (MSMEs), especially those that still rely on conventional business practices.

In Indonesia, MSMEs are recognized as one of the main drivers of economic growth and employment. However, many MSMEs continue to face difficulties in adapting to digital transformation due to limited technological knowledge, inadequate digital skills, and low readiness to respond to market changes. In Banda Aceh, this condition becomes increasingly important as local MSMEs must compete not only within traditional markets but also in rapidly growing digital environments. As consumer preferences continue to evolve, MSMEs are required to develop adaptive strategies that

enable them to survive and remain competitive in uncertain market conditions.

One of the important factors that may support MSME adaptability is digital competence transformation. Digital competence refers not only to the ability to operate digital technologies, but also to the capability to manage online communication, utilize digital information, and make business decisions based on digital data. The transformation of digital competence allows MSMEs to improve operational efficiency, strengthen customer relationships, and respond more effectively to changing consumer demands. Several studies have emphasized that digital transformation and technological capability play a significant role in improving MSME performance and sustainability.

This study adopts Dynamic Capabilities Theory as the main theoretical foundation. The theory explains that organizations can achieve sustainable competitiveness when they are able to sense environmental changes, seize opportunities, and reconfigure internal resources in response to market dynamics. In highly uncertain business environments, dynamic capabilities become essential for MSMEs to maintain flexibility and business resilience. Previous research has shown that dynamic capabilities positively influence digitalization processes and organizational adaptability among MSMEs.

Although previous studies have widely examined the relationship between digitalization and business performance, several research gaps remain. First, prior studies mainly focus on the direct effect of digital competence or digitalization on MSME performance, while limited research explains how digital competence transformation supports adaptive capability in responding to consumer behavior disruption. Second, the mediating role of business performance in strengthening MSME adaptive capability remains underexplored. Third, empirical studies discussing digital competence transformation within regional MSME contexts, particularly in Banda Aceh, are still limited. Therefore, this study seeks to fill these gaps by examining the effect of digital competence transformation on MSME adaptive capability, with business performance serving as a mediating variable based on the perspective of Dynamic Capabilities Theory.

Accordingly, this study aims to analyze how digital competence transformation contributes to MSME adaptive capability in responding to consumer behavior disruption in Banda Aceh. The findings are expected to provide theoretical contributions to the development of Dynamic Capabilities Theory and practical insights for policymakers and MSME practitioners in strengthening digital readiness and business sustainability in the digital era (OECD, 2023); (Verhoef et al., 2021).

Consumer behavior disruption in the digital era is characterized by increasing demands for service speed, transaction convenience, information transparency, and personalized customer experiences. Modern consumers no longer evaluate products solely based on price and quality, but also on how businesses leverage digital technology to build interaction and trust. This condition requires MSMEs to adapt dynamically in order to remain relevant and competitive amid rapid and uncertain changes in the business environment. ((Kotler, P., Kartajaya, H., & Setiawan, 2023); (Hossain, M., Akter, S., Kattiyapornpong, U., & Dwivedi, 2022). In this context, digital competence becomes a key factor in the success of MSMEs in addressing consumer behavior disruption. Digital competence does not merely refer to technical skills in operating digital devices, but also encompasses information literacy, the utilization of consumer data, digital marketing management, and the ability to integrate technology into business strategies. MSMEs with strong digital competence tend to be more adaptive and innovative, and are better positioned to enhance their business performance sustainably (Ramdani, B., Chevers, D., & Williams, 2024); (Cenamor, J., Sjödin, D. R., 2019).

From the perspective of Dynamic Capabilities Theory, digital competence can be understood as a strategic capability that enables MSMEs to perform sensing, seizing, and transforming processes in response to changes in the business environment. This capability allows MSME actors to rapidly identify shifts in consumer behavior, capture opportunities in digital markets, and transform their business models and marketing strategies to align with evolving market demands. Therefore, the transformation of digital competence is not merely operational in nature, but also strategic in creating sustainable competitive advantage (Teece, 2018); (Warner, K. S. R., & Wäger, 2019). Various empirical studies indicate that digital competence has a significant effect on adaptation strategies and MSME performance. MSMEs that are able to effectively leverage digital technology have been proven to better cope with market uncertainty, improve operational efficiency, and expand their marketing reach. Moreover, digital-based adaptation strategies serve as a mediating mechanism that links digital competence to improved business performance, particularly in responding to increasingly dynamic changes in consumer preferences (Li, F., Suomi, R., & Kuusisto, n.d.); (Yuliana, S., Nugroho, A., & Pratama, 2025).

Banda Aceh, as one of the regional economic growth centers in Indonesia, possesses substantial MSME potential, particularly in the retail, culinary, and service sectors. However, the level of digital competence among MSMEs in this area remains relatively varied and faces several challenges, including limited digital literacy,

a lack of continuous training, and the suboptimal strategic utilization of digital technologies. These conditions have resulted in some MSMEs being unable to respond effectively to consumer behavior disruption, thereby potentially hindering business growth and sustainability (BPS Aceh, 2024; KemenKopUKM, 2023).

Previous studies have generally focused on the partial adoption of digital technologies by MSMEs, such as the use of social media or online marketplaces, without examining digital competence as a dynamic capability integrated with adaptation strategies. Moreover, empirical research specifically highlighting the local context of MSMEs in Banda Aceh City remains limited. Therefore, this study holds academic significance in addressing the existing literature gap, as well as practical relevance in providing empirically based policy recommendations.

Based on the above discussion, this study aims to analyze the transformation of digital competence as a dynamic adaptation strategy for MSME actors in addressing consumer behavior disruption in Banda Aceh City. The findings are expected to provide theoretical contributions to the development of management and entrepreneurship studies, particularly within the context of MSMEs' dynamic capabilities, as well as practical implications for local governments and MSME support institutions in designing sustainable digital competence development programs.

LITERATURE REVIEW

Consumer Behaviour Disruption in the Digital Era

The rapid advancement of digital technology has significantly transformed consumer behavior in the processes of information search, evaluation of alternatives, and purchasing decisions. Consumers increasingly rely on digital platforms such as social media, online marketplaces, and web-based applications to interact with businesses. This transformation has led to consumer behavior disruption, characterized by growing demands for faster services, seamless transactions, transparent information, and personalized customer experiences (Verhoef et al., 2021); (Kotler dan keller, 2020)). This disruption requires MSME actors not only to understand changing consumer preferences, but also to respond to them in a swift and flexible manner. MSMEs that fail to adapt risk losing their competitiveness and business sustainability, particularly within an increasingly dynamic and uncertain business environment. Therefore, consumer behaviour disruption represents a critical external factor that necessitates the implementation of dynamic adaptation strategies. (OECD, 2023). From several theoretical opinions and empirical findings above, the following research hypothesis is formulated:

H_1: Digital competence has a positive and significant effect on the dynamic adaptation strategy of MSME actors in Banda Aceh City.

Digital Competence as a Strategic Capability of MSMEs

Digital competence refers to the ability of individuals or organizations to effectively utilize digital technologies in achieving business objectives. This competence encompasses digital literacy, the utilization of information technology, digital marketing management, as well as the ability to analyze consumer data to support strategic decision-making processes (Ramdani, B., Chevers, D., & Williams, 2024). In the context of MSMEs, digital competence functions not merely as an operational tool, but as a strategic resource that determines the capacity to adapt to changes in the business environment. Numerous empirical studies indicate that MSMEs with a high level of digital competence are better able to capitalize on digital market opportunities, enhance operational efficiency, and expand their marketing reach. Furthermore, digital competence plays a crucial role in fostering product and service innovation that aligns with the evolving needs of digital consumers (Li, F., Suomi, R., & Kuusisto, n.d.); (Yuliana, S., Nugroho, A., & Pratama, 2025). Thus, digital competence can be positioned as a fundamental foundation for MSMEs in responding to consumer behavior disruption. From several theoretical opinions and empirical findings above, the following research hypothesis is formulated:

H_2: Digital competence has a positive and significant effect on MSME performance in Banda Aceh City.

Dynamic Adaptation Strategy and Dynamic Capabilities Theory

Dynamic Capabilities Theory explains how organizations sustain competitive advantage through their ability to sense, seize, and transform in response to rapid environmental changes (Teece, 2018) In the context of MSMEs, dynamic adaptation strategies refer to the ability of business actors to identify shifts in consumer behavior, capture digital market opportunities, and continuously adjust their business and operational strategies. Digital competence plays a crucial role in shaping dynamic adaptation strategies. It enables MSMEs to monitor market trends in real time, respond swiftly to changes in consumer demand, and integrate digital technologies into their business models. Warner and Wäger (2019) further emphasize that digital capabilities serve as a primary enabler for organizations in building strategic adaptation in the digital era. From several theoretical opinions and empirical findings above, the following research hypothesis is formulated:

H_3: Dynamic adaptation strategy has a positive and significant effect on MSME performance in Banda Aceh City.

MSME Performance in the Context of Digital Transformation

MSME performance is generally measured using both financial and non-financial indicators, such as increased sales, business growth, operational efficiency, and customer satisfaction. Digital transformation, supported by strong digital competence, has been shown to enhance MSME performance through the optimization of digital marketing, improved business process efficiency, and strengthened customer relationships (Ramdani, B., Chevers, D., & Williams, 2024); (Cenamor, J., Sjödin, D. R., 2019)However, the relationship between digital competence and MSME performance is not always direct. Several studies indicate that dynamic adaptation strategies function as a mediating mechanism that bridges the influence of digital competence on business performance. This implies that digital competence will generate optimal impact on MSME performance when it is implemented through appropriate and responsive adaptation strategies aligned with changes in consumer behavior (Li, F., Suomi, R., & Kuusisto, n.d.) From several theoretical opinions and empirical findings above, the following research hypothesis is formulated:

H_4: Dynamic adaptation strategy mediates the effect of digital competence on MSME performance in Banda Aceh City.

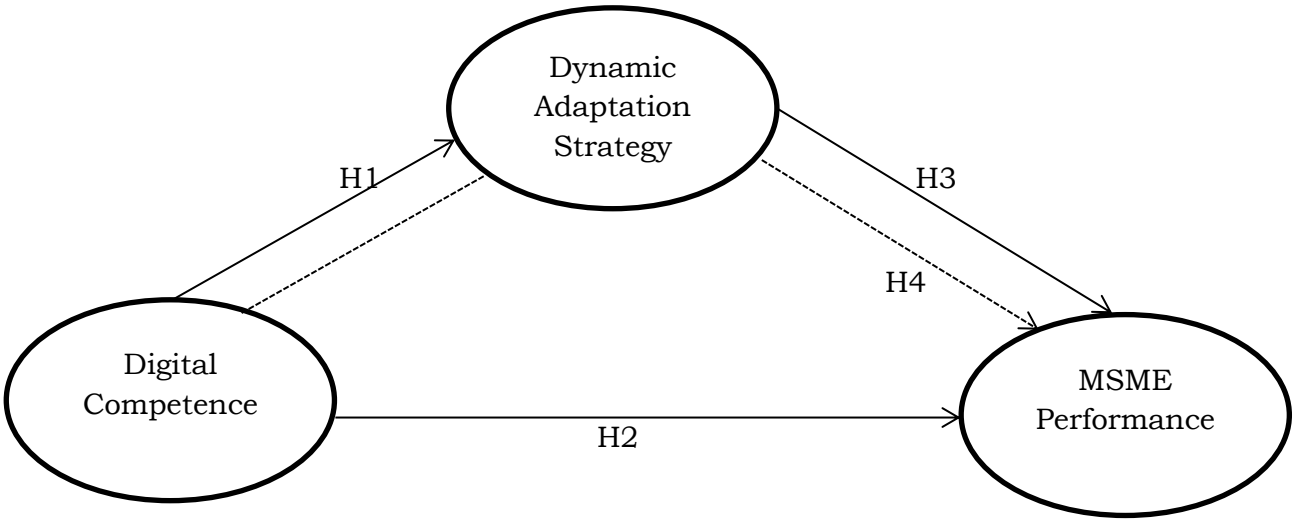

Figure 1. Research Framework

RESEARCH METHODS

This study adopts a quantitative approach using Structural Equation Modelling (SEM) to examine the causal relationships between digital competence, dynamic adaptation strategy, and MSME performance, with dynamic adaptation strategy acting as a mediating variable. The SEM method is

chosen due to its strong capability to simultaneously assess complex relationships among latent constructs and to evaluate both direct and indirect effects within a single comprehensive model. Furthermore, SEM enables the testing of the model's overall validity and reliability, providing a rigorous analytical framework to understand how digital competence influences MSME performance both directly and through adaptive strategic mechanisms.

The research location was purposively selected to focus on MSMEs in Banda Aceh City. This area represents a relevant setting for the study due to the significant presence of MSMEs operating across various sectors such as culinary, trade, and services. The diversity of business activities, combined with the increasing adoption of digital technologies among MSME actors, makes Banda Aceh an appropriate context for examining digital competence transformation and adaptive strategies. Furthermore, the dynamic changes in consumer behaviour in this region provide a strong basis for analysing how MSMEs respond to market disruptions.

This study employed a purposive sampling technique to select respondents who met specific criteria aligned with the research objectives, particularly MSME actors who have adopted or are in the process of adopting digital practices. The research instrument consisted of a structured questionnaire developed based on variable indicators adapted from relevant theories and prior empirical studies. A total sample of 300 MSMEs in Banda Aceh was determined to meet the minimum requirements for Structural Equation Modelling (SEM) analysis. According to methodological guidelines, a minimum sample size of 200 respondents is considered sufficient to produce stable and reliable estimates; therefore, the selected sample size of 300 is deemed adequate to ensure the robustness, validity, and reliability of the proposed research model.

The methodological approach adopted in this study ensures a rigorous examination of the hypothesized relationships while accounting for the complex interactions between digital competence, dynamic adaptation strategy, and MSME performance. By employing a substantial sample size and a robust analytical technique such as SEM, this study enhances its capacity to generate reliable and insightful findings. These results are expected to contribute not only to the development of academic discourse but also to provide practical implications for strengthening MSME strategies in adapting to consumer behavior disruption in a rapidly evolving digital environment.

Table 1
Functional Definitions of Variables

Variabel		Indikator	Skala
Digital Competence	The ability of MSME actors to effectively utilize digital technologies, platforms, and data to support business activities and decision-making	Digital platform usage, online communication skills, digital marketing capability, data utilization, technology adoption	Likert Scale (1–5)
Dynamic Adaptation Strategy	The capability of MSMEs to respond flexibly and proactively to changes in consumer behavior and market conditions	Market responsiveness, innovation in products/services, flexibility in operations, customer engagement adaptation	Likert Scale (1–5)
MSME Performance	The level of business achievement in terms of financial and non-financial outcomes	Sales growth, profit growth, customer growth, operational efficiency	Likert Scale (1–5)

RESULT AND DISCUSSION

Respondent Profile

The demographic characteristics of respondents based on age groups are presented in Table 2. Based on data collected from 300 respondents, the majority fall within the age range of 26–41 years, accounting for 143 respondents (48%). The second-largest group is aged 17–25 years, with 123 respondents (41%). Meanwhile, 22 respondents (7%) are above 41 years old, and 12 respondents (4%) are under 17 years old. These findings indicate that most respondents are within the productive age range, suggesting a strong potential for adaptability and engagement with digital transformation among MSME actors.

Out of a total of 300 respondents, the majority of MSMEs operate in the Food and Beverage sector, with 117 respondents (39%). This is followed by the Fashion sector with 43 respondents (14%), and the Handicraft sector with 39 respondents (13%). The Services sector accounts for 37 respondents (12%), while the Trade sector includes 32 respondents (11%). The Tourism and Transportation sectors each consist of 6 respondents (2%), and the remaining 20 respondents (7%) fall into other business sectors. These findings indicate that the Food and Beverage sector represents the most dominant MSME category within the research sample.

Out of the total 300 respondents, the majority possess a Diploma (D3) or Bachelor's degree (S1), accounting for 150 respondents (50%). This is followed by 124 respondents (41%) whose highest level of education is senior high school (SMA). A smaller proportion, consisting of 13 respondents (4%), have a junior high school (SMP) education or below. In addition, 10

respondents (4%) hold a Master's degree (S2), while only 3 respondents (1%) have attained a Doctoral degree (S3). These findings indicate that most respondents have a moderate to high educational background, with a dominant share holding Diploma or Bachelor's qualifications.

Outer Model Analysis

In this study, hypothesis testing was carried out using the Partial Least Squares (PLS) approach with the assistance of Smart PLS 3.0 software. The outer model evaluation was conducted to assess the relationship between latent constructs and their respective indicators. This evaluation includes tests of convergent validity, discriminant validity, reliability, and multicollinearity to ensure that the measurement model meets the required statistical criteria before proceeding to the structural model analysis.

An indicator is considered to demonstrate good convergent validity when its outer loading value exceeds 0.70. The outer loading values for each indicator in this study are presented in Table 3. Based on the results, most indicators of the research variables show outer loading values above 0.70, indicating strong convergent validity. However, as suggested by Ghozali & Latan (2015), outer loading values above 0.50 are still acceptable in exploratory research contexts. The findings reveal that none of the indicators have outer loading values below 0.50, which implies that all indicators meet the minimum threshold for convergent validity. Therefore, all indicators are deemed valid and suitable for inclusion in the subsequent analysis.

In this study, indicators that did not meet the outer loading criteria were eliminated during the evaluation process. After several rounds of refinement, including the removal of indicators with low loading values, the final outer model results were obtained as presented in Table 3. In addition to evaluating outer loading values, convergent validity can also be assessed through the Average Variance Extracted (AVE). An AVE value greater than 0.50 indicates that a construct has adequate convergent validity (Fornell & Larcker, 1981). Table 4 presents the AVE values for each variable in this study. The results show that all variables have AVE values above the threshold of 0.50, namely: Digital Competence (X), Dynamic Adaptation Strategy (Z), and MSME Performance (Y). These findings indicate that all constructs meet the required criteria for convergent validity, meaning that the indicators used are capable of explaining the variance of their respective constructs adequately and are therefore suitable for further analysis.

Discriminant Validity

Discriminant validity is assessed to ensure that each construct or latent variable is empirically distinct from the others. In this study, discriminant validity is evaluated

using cross-loading values. An indicator is considered to meet the discriminant validity criterion if its loading on the intended construct is higher than its loadings on other constructs (Chin, 1998). Table 5 presents the cross-loading values for each indicator. The results indicate that each indicator demonstrates the highest loading on its respective construct compared to other constructs. Therefore, it can be concluded that all indicators in this study exhibit good discriminant validity and are capable of accurately representing their corresponding variables.

In addition to cross-loading, discriminant validity can also be evaluated using the Heterotrait–Monotrait Ratio (HTMT). The HTMT test is applied to ensure that each construct in the model is empirically distinct and does not exhibit excessive overlap with other constructs. A construct is considered to have good discriminant validity if the HTMT value is below the recommended threshold of 0.90. Based on the HTMT results presented in Table 6, all construct values are below 0.90, indicating that each variable—Digital Competence, Dynamic Adaptation Strategy, and MSME Performance—meets the discriminant validity criteria and can be clearly distinguished from one another.

Table 6 presents the results of the Heterotrait–Monotrait Ratio (HTMT) test among the variables in this study, namely Digital Competence, Dynamic Adaptation Strategy, and MSME Performance. The HTMT value between Digital Competence and Dynamic Adaptation Strategy is 0.521, between Digital Competence and MSME Performance is 0.548, and between Dynamic Adaptation Strategy and MSME Performance is 0.769. All of these values are below the recommended threshold of 0.90, indicating that there are no issues related to discriminant validity among the constructs. These findings confirm that each variable represents a distinct concept and does not overlap with others. Therefore, the measurement model is considered valid and suitable for further structural model analysis.

Reliability Test

Reliability testing reflects the level of consistency and stability of a measurement instrument in capturing a particular construct (Abdillah, 2015). In this study, reliability was assessed using Composite Reliability and Cronbach's Alpha. A construct is considered reliable if it achieves values greater than 0.70 for both measures. Table 7 presents the Composite Reliability and Cronbach's Alpha values for each variable in this study. The results indicate that all constructs—Digital Competence, Dynamic Adaptation Strategy, and MSME Performance—meet the recommended threshold, confirming that the measurement instrument is consistent and reliable for further analysis.

Table 7 presents the Composite Reliability and Cronbach's Alpha values for each research variable, which are used to assess the internal consistency and reliability of the measurement instruments. All variables demonstrate values exceeding the recommended threshold of 0.7, indicating high reliability and good internal consistency. The Composite Reliability values are 0.943 for Financial Literacy (X), 0.901 for Business Performance (Z), and 0.870 for Business Sustainability (Y), while Cronbach's Alpha values are 0.931 for Financial Literacy (X), 0.871 for Business Performance (Z), and 0.818 for Business Sustainability (Y). These results confirm that all constructions in this study are reliable and suitable for further analysis.

Multicollinearity Test

Multicollinearity is assessed using tolerance values and the Variance Inflation Factor (VIF). Multicollinearity is indicated when the tolerance value is below 0.10 or the VIF value exceeds 10. In this study, the absence of multicollinearity is confirmed when tolerance values are above 0.10 or VIF values are below 10. Table 8 presents the VIF values for each variable in the model. The results of the collinearity statistics show that the VIF value of Digital Competence on MSME Performance is 1.032, the VIF value of Digital Competence on Dynamic Adaptation Strategy is 1.214, and the VIF value of Dynamic Adaptation Strategy on MSME Performance is 1.356. Since all VIF values are below the recommended threshold, it can be concluded that there is no multicollinearity issue in the structural model.

Inner Model Analysis

The inner model is used to examine the relationships between latent variables within the structural model. The evaluation of the inner model can be conducted through several analyses, including R-square (R^2), Goodness of Fit (GoF), path coefficients, and specific indirect effects. These assessments are used to determine the explanatory power of the model, the strength and direction of relationships among constructs, as well as the significance of direct and indirect effects within the proposed research framework.

Model Fit Test (Goodness of Fit)

Structural model evaluation is conducted to examine the relationships between manifest and latent variables, including the main predictor, mediator, and outcome variables within a complex research model. The model fit assessment consists of two main evaluations, namely R-square (R^2) and Q-square (Q^2). The R^2 value indicates the extent to which exogenous variables explain the variance of endogenous variables. A higher R^2 value reflects a greater level of explanatory power. According to Ghozali & Latan (2015), R^2 values of 0.75, 0.50, and 0.25 can be interpreted as strong, moderate, and weak levels of model explanation, respectively.

Table X presents the R^2 (coefficient of determination) values obtained in this study.

Based on Table 9, the R-square value is used to determine the extent to which Digital Competence influences MSME Performance, which is shown by a value of 0.235 or 23.5%. This indicates a weak level of explanatory power. Meanwhile, the combined effect of Digital Competence and Dynamic Adaptation Strategy on MSME Performance is reflected by an R-square value of 0.487 or 48.7%, indicating a moderate relationship.

The next evaluation is the Q-square (Q^2) test. The Q^2 value in structural model assessment is examined through predictive relevance. The Q^2 statistic is used to assess how well the observed values are reconstructed by the model and its parameter estimates. A Q^2 value greater than 0 indicates that the model has predictive relevance, whereas a value below 0 indicates a lack of predictive relevance.

Table 10 presents the results of the Q-square (Q^2) predictive relevance test for the endogenous variables in the model, namely MSME Performance and Dynamic Adaptation Strategy. The Q^2 value for MSME Performance (Y) is 0.127, indicating that the model has an adequate level of predictive relevance in explaining variations in MSME performance. Meanwhile, Dynamic Adaptation Strategy (Z) shows a higher Q^2 value of 0.246, indicating a stronger predictive capability of the model in explaining adaptive behavior outcomes. Since both Q^2 values are greater than zero, it can be concluded that the structural model demonstrates acceptable predictive relevance for all endogenous variables, with stronger predictive power observed in the Dynamic Adaptation Strategy construct.

Hypothesis Testing

Path Coefficient Testing

Path coefficients were examined using the bootstrapping procedure to determine t-statistics, p-values, and original sample estimates. A p-value below 0.05 indicates a significant relationship between variables, whereas a p-value above 0.05 indicates a non-significant effect. In this study, a significance level of 5% (t-statistic > 1.96) was used as the decision criterion for hypothesis testing. Table 11 presents the path coefficient results of the structural model.

Based on Table 11, the first hypothesis indicates that Digital Competence has a positive and significant effect on MSME Performance. The results show a t-statistic value of 9.214, a path coefficient of 0.489, and a p-value of 0.000. Since the t-statistic exceeds 1.96 and the p-value is below 0.05, Hypothesis 1 is accepted, confirming a significant positive relationship between Digital Competence and MSME Performance.

The second hypothesis shows that Digital Competence has a positive and significant effect on Dynamic Adaptation Strategy. The results indicate a t-statistic

value of 4.327, a path coefficient of 0.276, and a p-value of 0.000. Since the t-statistic is greater than 1.96 and the p-value is below 0.05, Hypothesis 2 is accepted, confirming a significant positive relationship between Digital Competence and Dynamic Adaptation Strategy.

The third hypothesis indicates that Dynamic Adaptation Strategy has a positive and significant effect on MSME Performance. The results show a t-statistic value of 11.842, a path coefficient of 0.541, and a p-value of 0.000. Since the t-statistic exceeds 1.96 and the p-value is less than 0.05, Hypothesis 3 is accepted, indicating a significant positive relationship between Dynamic Adaptation Strategy and MSME Performance.

Indirect Effect Testing

The next step is to examine the indirect effect, which is assessed through the specific indirect effect results. A p-value below 0.05 indicates a significant mediating effect, meaning that the mediating variable transmits the influence of the exogenous variable to the endogenous variable. In contrast, a p-value above 0.05 indicates that no mediating effect exists, meaning the relationship is direct (Juliandi, 2018). Table 12 presents the results of the specific indirect effects in this study.

Based on Table 12, the fourth hypothesis shows that Dynamic Adaptation Strategy significantly mediates the relationship between Digital Competence and MSME Performance. The results indicate a t-statistic value of 7.412 and a p-value of 0.000. Since the t-statistic is greater than 1.96 and the p-value is less than 0.05, Hypothesis 4 is accepted. This finding confirms that Dynamic Adaptation Strategy plays a significant mediating role in the relationship between Digital Competence and MSME Performance, indicating the presence of partial mediation. Thus, Digital Competence affects MSME Performance both directly and indirectly through Dynamic Adaptation Strategy.

Table 2
Respondent Profil

Characteristics	Category	Frequency (n=300)	Percentage (%)
Age	< 17 years	14	5%
	17–25 years	118	39%
	26–41 years	146	49%
	> 41 years	22	7%
Education Level	Junior High School or below	15	5%
	Senior High School	120	40%

Characteristics	Category	Frequency (n=300)	Percentage (%)
	Diploma (D3) / Bachelor (S1)	148	49%
	Master (S2)	13	4%
	Doctoral (S3)	4	1%
Business Sector	Food & Beverage	121	40%
	Fashion	41	14%
	Handicraft	36	12%
	Services	38	13%
	Trade	33	11%
	Tourism	7	2%
	Transportation	5	2%
	Others	19	6%

Source: Processed primary data, 2026

Table 3
Outer Loading Values After Elimination

Variable	Indicator	Outer Loading
Digital Competence (X)	X1	0.742
	X2	0.781
	X3	0.804
	X4	0.768
	X5	0.812
Dynamic Adaptation Strategy (Z)	Z1	0.735
	Z2	0.799
	Z3	0.821
	Z4	0.776
MSME Performance (Y)	Y1	0.758
	Y2	0.803
	Y3	0.790
	Y4	0.835

Source: Processed primary data, 2026

Table 4
Value Average Variance Extracted (AVE)

Variable	AVE Value	Remark
Digital Competence (X)	0.592	Valid
Dynamic Adaptation Strategy (Z)	0.614	Valid
MSME Performance (Y)	0.578	Valid

Source: Processed primary data, 2026

Table 5
t Test Result

Indicator	Digital Competence (X)	Dynamic Adaptation Strategy (Z)	MSME Performance (Y)
X1	0.742	0.521	0.498
X2	0.781	0.533	0.515
X3	0.804	0.547	0.522
X4	0.768	0.512	0.501
X5	0.812	0.559	0.538
Z1	0.531	0.735	0.602
Z2	0.548	0.799	0.621
Z3	0.566	0.821	0.645
Z4	0.520	0.776	0.598
Y1	0.512	0.603	0.758
Y2	0.525	0.621	0.803
Y3	0.539	0.645	0.790
Y4	0.551	0.658	0.835

Source: Processed primary data, 2026

Table 6
Heterotrait-Monotrait Ratio (HTMT)

Variables	Digital Competence (X)	Dynamic Adaptation Strategy (Z)	MSME Performance (Y)
Digital Competence (X)	—	0.521	0.548
Dynamic Adaptation Strategy (Z)	0.521	—	0.769
MSME Performance (Y)	0.548	0.769	—

Source: Processed primary data, 2026

Table 7
Composite Reliability

Variable	Cronbach's Alpha	Composite Reliability	Remark
Digital Competence (X)	0.842	0.887	Reliable
Dynamic Adaptation Strategy (Z)	0.861	0.903	Reliable
MSME Performance (Y)	0.879	0.915	Reliable

Source: Processed primary data, 2026

Table 8
Collinearity Statistics (VIF)

Relationship	VIF Value	Remark
Digital Competence → MSME Performance	1.142	No multicollinearity
Digital Competence → Dynamic Adaptation Strategy	1.218	No multicollinearity
Dynamic Adaptation Strategy → MSME Performance	1.336	No multicollinearity

Source: Processed primary data, 2026

Table 9
R-Square Values

Endogenous Variable	R-Square
Dynamic Adaptation Strategy (Z)	0.243
MSME Performance (Y)	0.487

Source: Processed primary data, 2026

Table 10
Q-Square Values

Endogenous Variable	Q-Square (Q^2)	Interpretation
Dynamic Adaptation Strategy (Z)	0.134	Low predictive relevance
MSME Performance (Y)	0.262	Moderate predictive relevance

Source: Processed primary data, 2026

Table 11
Path Coefficient (Direct Effect)

Hypothesis	Relationship	Original Sample (O)	T-Statistic	P-Value	Decision
H1	Digital Competence → Dynamic Adaptation Strategy	0.276	4.327	0.000	Supported
H2	Digital Competence → MSME Performance	0.489	9.214	0.000	Supported
H3	Dynamic Adaptation Strategy → MSME Performance	0.541	11.842	0.000	Supported

Source: Processed primary data, 2026

Table 12
Specific Indirect Effects

Hypothesis	Relationship	Original Sample (O)	T-Statistic	P-Value	Decision
H4	Digital Competence → Dynamic Adaptation Strategy → MSME Performance	0.149	7.412	0.000	Supported

Source: Processed primary data, 2026

Discussion

The Effect of Digital Competence on MSME Performance

Digital competence has a positive and significant effect on MSME performance. MSME actors who possess higher digital competence tend to be more capable of utilizing digital technologies such as online platforms, digital marketing tools, and data-driven decision-making systems. These

abilities enhance operational efficiency, expand market reach, and improve customer engagement. As a result, digital competence plays an important role in improving MSME performance by enabling businesses to operate more effectively and competitively in a digital-based market environment. Digital competence is a crucial capability that enables MSME actors to adapt to the rapid development of digital technology and changing consumer behavior. It plays an important role in strengthening business competitiveness in an increasingly digital economy (Kurnia Rahayu et al., 2023). Digital competence allows MSME actors to effectively utilize digital platforms, online marketing tools, and data-driven decision-making systems to improve business operations and market reach (Sari et al. 2022).

Improved digital competence contributes significantly to enhancing MSME performance by increasing operational efficiency, customer engagement, and sales growth (Titin et al., 2024). It also supports business owners in managing digital transactions, expanding market access, and optimizing promotional strategies in online environments (Hendrawan et al., 2019). When integrated with adaptive strategies in responding to consumer behavior disruption, digital competence becomes a key driver of sustainable MSME performance (Asandimitra et al., 2024).

From a theoretical perspective, the findings of this study can be explained using the Resource-Based View (RBV) theory. RBV posits that a firm's competitive advantage and performance are determined by its ability to acquire, develop, and utilize valuable, rare, inimitable, and non-substitutable (VRIN) resources (Barney, 1991). In the context of this study, digital competence can be regarded as a critical intangible strategic resource owned by MSME actors.

Digital competence, which includes knowledge and skills in utilizing digital technologies, enables business actors to manage business operations more efficiently, enhance market reach through digital platforms, and improve responsiveness to changing consumer behavior. MSMEs in Banda Aceh City with higher levels of digital competence are better positioned to leverage their internal capabilities to improve operational efficiency, adapt to market disruptions, and enhance overall business performance. This supports the RBV argument that superior internal capabilities such as digital competence are key drivers of competitive advantage and sustainable business performance.

The path coefficient results show a t-statistic of 9.214 (> 1.96), a coefficient of 0.489, and a p-value of 0.000 (< 0.05). This confirms that Digital Competence has a positive and significant effect on MSME Performance. These findings are consistent

with (Titin et al., 2024; (Sari et al., 2022); (Ningsih et al., 2024), who found that digital capability and the utilization of digital platforms significantly enhance MSME performance. Furthermore, this result is also supported by (Muhammad, 2026) which emphasizes that digital transformation enables MSMEs to improve adaptability and respond more effectively to changes in consumer behavior.

The Effect of Digital Competence on Dynamic Adaptation Strategy (H_2)

From a theoretical perspective, the relationship between Digital Competence and Dynamic Adaptation Strategy can be explained using the Resource-Based View (RBV) theory. RBV emphasizes that firms achieve sustainable competitive advantage when they are able to effectively utilize internal strategic resources (Barney, 1991). In this context, digital competence is considered a key intangible resource that enables MSME actors to respond quickly and effectively to changes in consumer behavior and digital market disruption.

Digital competence enhances MSME actors' ability to understand digital trends, adopt digital tools, and implement adaptive business strategies. These capabilities allow MSMEs to continuously adjust their business models, improve customer engagement, and respond to environmental uncertainty in a more flexible and proactive manner. Therefore, higher digital competence leads to stronger dynamic adaptation strategies among MSME actors in Banda Aceh City.

The path coefficient results show a t-statistic of 4.327 (> 1.96), a coefficient of 0.276, and a p-value of 0.000 (< 0.05). This confirms that Digital Competence has a positive and significant effect on Dynamic Adaptation Strategy. These findings are consistent with Asandimitra et al. (2024), who found that digital capability significantly enhances organizational adaptability in responding to rapid digital transformation.

The Effect of Dynamic Adaptation Strategy on MSME Performance (H_3)

From a theoretical perspective, the relationship between Dynamic Adaptation Strategy and MSME Performance can be explained using the Resource-Based View (RBV) theory. RBV emphasizes that firm performance is strongly influenced by the ability to effectively utilize internal resources and dynamic capabilities to respond to environmental changes (Barney, 1991). In this study, dynamic adaptation strategy represents a firm's capability to adjust its business processes, marketing approaches, and operational activities in response to rapid changes in consumer behavior and digital disruption.

MSMEs that are able to develop strong adaptive strategies tend to respond more quickly to market changes, improve customer satisfaction, and optimize their

operational processes. This adaptive capability enables MSMEs to maintain competitiveness and achieve better performance outcomes in a dynamic business environment. Therefore, dynamic adaptation strategy plays a crucial role in enhancing MSME performance in Banda Aceh City.

The path coefficient results show a t-statistic of 11.842 (> 1.96), a coefficient of 0.541, and a p-value of 0.000 (< 0.05). This confirms that Dynamic Adaptation Strategy has a positive and significant effect on MSME Performance. These findings are consistent with (Ahsin et al., 2025), who found that adaptive capability significantly improves organizational performance in a rapidly changing digital environment.

The Effect of Digital Competence on MSME Performance through Dynamic Adaptation Strategy (H_4)

From a theoretical perspective, the mediating role of Dynamic Adaptation Strategy in the relationship between Digital Competence and MSME Performance can also be explained using the Resource-Based View (RBV) theory. RBV suggests that firms achieve superior performance when they are able to transform internal resources into dynamic capabilities that support strategic adaptation (Barney, 1991). In this context, digital competence serves as a fundamental internal resource, while dynamic adaptation strategy functions as a capability that transforms this resource into improved performance outcomes.

Digital competence enables MSME actors to effectively identify digital opportunities, adopt technological tools, and implement adaptive business strategies. However, its impact on performance becomes stronger when it is supported by a well-developed dynamic adaptation strategy. This means that MSMEs not only rely on digital skills but also need adaptive capabilities to fully translate digital competence into improved business performance. Therefore, dynamic adaptation strategy plays a mediating role in strengthening the influence of digital competence on MSME performance in Banda Aceh City.

The specific indirect effect results show a t-statistic of 7.412 (> 1.96), a coefficient of 0.149, and a p-value of 0.000 (< 0.05). This confirms that Dynamic Adaptation Strategy significantly mediates the relationship between Digital Competence and MSME Performance. These findings indicate partial mediation, meaning that Digital Competence influences MSME Performance both directly and indirectly through Dynamic Adaptation Strategy.

CONCLUSION

Based on the research conducted using the Partial Least Squares (PLS) data analysis method, this study concludes that Digital Competence has a positive and significant

effect on Dynamic Adaptation Strategy, indicating that higher levels of digital capability enable MSME actors to develop stronger adaptive responses to market changes and consumer behavior disruption. Digital Competence also shows a positive and significant influence on MSME Performance, highlighting its important role in improving operational efficiency, market reach, and business competitiveness in the digital era.

Furthermore, Dynamic Adaptation Strategy is found to have a positive and significant effect on MSME Performance, suggesting that MSMEs with stronger adaptive strategies are more capable of maintaining and improving their business performance in a dynamic environment. In addition, the findings confirm that Dynamic Adaptation Strategy mediates the relationship between Digital Competence and MSME Performance, meaning that Digital Competence enhances MSME Performance both directly and indirectly through improved adaptive strategic capabilities.

RESEARCH IMPLICATION

The findings of this study provide important managerial implications for both MSME actors and local governments in Banda Aceh City. For MSME owners, the results highlight the importance of digital competence as a strategic capability that enhances business performance through improved utilization of digital technologies, more effective marketing strategies, and better responsiveness to consumer behavior changes. MSMEs are encouraged to strengthen their digital skills, including the use of digital platforms, online marketing tools, data-driven decision-making, and e-commerce systems to translate digital competence into improved operational performance and business competitiveness.

For local governments, these findings suggest the need to prioritize digital competence development in MSME empowerment programs by providing targeted digital training, continuous mentoring, and practical support for digital transformation. Such initiatives can help MSMEs develop stronger adaptive strategies, improve business performance, and ultimately enhance their sustainability and contribute to regional economic growth in the digital era.

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