

THE INFLUENCE OF DIGITAL SKILL ON MARKETING PERFORMANCE OF MSMEs IN SURABAYA CITY IN THE ERA OF DIGITAL TRANSFORMATION

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Abstract. Digital transformation requires MSMEs to possess adequate digital skills to work effectively and efficiently. Digital skill have become a strategic competency because they play a crucial role in improving marketing performance in the era of digital transformation. However, differences in digital skill mastery levels remain a challenge for many businesses. This study aims to analyze the influence of digital skills on marketing performance using a quantitative approach with explanatory research. Data were collected through questionnaires from 170 MSMEs in Surabaya using a purposive sampling technique. Data analysis was conducted using Structural Equation Modeling-Partial Least Squares (SEM-PLS), which included testing the outer and inner models. The results showed that all indicators met the construct validity and reliability criteria. Furthermore, digital skills were shown to have a positive and significant effect on marketing performance. These findings indicate that improving digital skills can improve the quality, quantity, timeliness, effectiveness, and responsibility in achieving marketing performance targets. This study provides practical implications for business owners and practitioners to prioritize digital skill development as a strategy to improve marketing performance in the era of digital transformation.

Keywords: digital skill, marketing performance, MSMEs, digital transformation.

I. Introduction

Digital transformation has become a global phenomenon that has significantly changed the way Micro, Small, and Medium Enterprises (MSMEs) conduct business activities, manage market strategies, and adapt to the dynamics of an increasingly competitive business environment (Santoso et al., 2025). Developments in digital technologies such as integrated information systems, cloud-based applications, big data, and artificial intelligence are encouraging MSMEs to adopt more digital, faster, and more efficient marketing systems (Adiningsih et al., 2024). This situation requires MSMEs, as the primary drivers of the economy, to possess skills relevant to technological developments to support the achievement of optimal Marketing Performance targets (Wijaya et al., 2025).

In the era of digital transformation, Marketing Performance is no longer solely determined by conventional marketing strategies, but also by the ability to utilize digital technology to reach markets and consumers (Verhoef et al., 2021). Digital skills include the ability to operate digital devices, use marketing and e-commerce applications, manage digital information for market research, and adapt to new technological trends (Đor & Milanovi, 2025). MSMEs with strong digital skills tend to adapt more quickly to changes in market algorithms, are able to market their products more effectively, and achieve higher marketing performance than MSMEs with lower digital skills (Sharabati et al., 2024).

However, in practice, a digital skill gap still exists among MSMEs. Not all MSME business owners or managers have the same level of technological mastery, due to differences in educational background, age, or limited opportunities for digital training (Rahman et al., 2025). This digital skills gap has the potential to cause various problems, such as delays in responding to market opportunities, low promotional reach, and decreased sales conversions (Enshassi et al., 2025). This situation can directly negatively impact MSME marketing performance and overall competitiveness.

The city of Surabaya, as one of the largest centers of economic and business growth in Indonesia, is also experiencing a massive acceleration of digital transformation in the MSME sector (Majid et al., 2024). MSMEs in Surabaya are increasingly required to rely on digital technology in their operational processes, customer communications, and strategic decision-making (Dyatmika et al., 2024). This makes mastering digital skills an urgent need for MSMEs to optimally contribute to the highly dynamic digital economy ecosystem.

Several previous studies have shown that digital skills positively impact business success. Research by Ferreira et al., (2022) found that mastering digital skills can increase marketing effectiveness and business productivity. Furthermore, Yitayew & Ketema, (2025) demonstrated that digital skills significantly impact organizational performance by increasing efficiency and the quality of market reach. Research by Salah & Ayyash, (2024) showed that businesses with high levels of digital skills are better able to adapt to e-commerce systems, resulting in better marketing performance. Recent studies by Abdurrahman et al., (2024) also confirmed that digital skills are a crucial factor in supporting the achievement of marketing targets in organizations undergoing digital transformation. However, empirical research specifically examining the context of MSMEs in Surabaya is still limited, making this study crucial to enrich the empirical evidence in the local context.

Therefore, research is needed that can provide an empirical overview of the extent to which digital skills influence marketing performance in the context of digital transformation. Based on this description, this study is crucial to analyze the influence of digital skills on marketing performance in Surabaya's MSMEs in the era of digital transformation. The results of this study are expected to provide theoretical contributions to the development of marketing management studies and provide practical implications for business owners and the city government in designing digital skills development strategies to improve marketing performance and the competitiveness of Surabaya's MSMEs.

II. Literature Review

1. Digital Skill

Digital skills are defined as an individual's ability to find, evaluate, and communicate information effectively and efficiently through various digital platforms (Audrin et al., 2024). For MSMEs in Surabaya, these skills are not merely basic technical skills in operating devices, but rather the strategic capacity to integrate technology into business models to face increasingly fierce competition in the era of digital transformation. Mastery of digital skills is a key foundation for businesses to remain relevant amidst changing consumer behavior, which increasingly relies on the digital ecosystem.

The scope of digital skills encompasses mastery of hardware, marketing applications, and digital data analysis capabilities, which are crucial for business decision-making (Bachmann et al., 2024). Based on the context of this research, the main indicators of digital skills include proficiency in operating digital devices, using work or marketing applications (e-commerce and social media), managing digital information for market research, adapting to rapid technological updates, and the ability to solve technical problems that arise in daily business activities.

Adequate digital skills enable MSMEs to work more quickly and accurately in responding to fluctuating market dynamics. With these skills, geographic barriers and conventional resource limitations can be overcome through efficient digital processes, enabling small businesses to compete on par with larger organizations (Bao et al., 2025). Thus, digital skills are a crucial catalyst for transforming the way MSMEs manage their operations toward a more modern and productive system.

2. Marketing Performance

Marketing performance is a strategic construct used to measure the success and effectiveness of a company's marketing activities in achieving established business goals. In the context of MSMEs, marketing performance is a vital indicator reflecting the success of interactions between products and target markets through various communication and distribution channels (Butkouskaya & Llonch-andreu, 2024). This performance is the end result of a series of strategies encompassing promotion, pricing, customer relationship management, and market access.

Dimensions used to measure marketing performance include the quality of marketing strategies, the quantity of results (such as sales volume and customer growth), the timeliness of responding to market trends, and the effectiveness of the use of marketing resources or budgets. This performance is not solely measured by sales figures, but also by professional responsibility in maintaining brand integrity and sustainable customer satisfaction in the digital realm. Optimal achievement of these indicators demonstrates a healthy and competitive market position for MSMEs.

The high marketing performance achieved by MSMEs in Surabaya is the result of the synergy between technology utilization and accurate strategy execution in the field (Subagja et al., 2022). Amidst Surabaya's dynamic economic ecosystem, strengthening marketing performance is crucial to ensuring long-term business growth. Digital marketing success, as reflected in marketing performance, will determine whether an MSME can survive or be eliminated by competition in an increasingly globally integrated digital marketplace.

III. Research Method

This study employed a quantitative approach with an explanatory research design. The quantitative approach was chosen because the study aimed to test the causal relationship between Digital Skills as the independent variable and Marketing Performance as the dependent variable based on numerical data. The explanatory design was used to explain the extent to which Digital Skills can influence Marketing Performance among MSMEs in the context of digital transformation. The research model was tested using Structural Equation Modeling–Partial Least Squares (SEM-PLS), as this method is capable of analyzing relationships between latent variables simultaneously, is effective for medium sample sizes, and does not require strict assumptions of data normality.

Research Population and Sample

The population in this study was all owners or managers of Micro, Small, and Medium Enterprises (MSMEs) in Surabaya City that have implemented digital technology in their operational processes and marketing strategies.

The sampling technique used purposive sampling, which is a technique for determining samples based on certain criteria that align with the research objectives. The sample criteria in this study were:

- a. Active MSMEs in Surabaya City that have used digital systems.

- b. Businesses that have been operating for at least one year.
- c. Use digital tools or marketing applications (social media, e-commerce, or digital payments) in their daily business activities.

The sample size used was 170 respondents. This number meets the minimum requirement for SEM-PLS analysis, which is 10 times the maximum number of indicators in a single construct. Therefore, the model is deemed suitable for analysis.

Data Type and Source

This study used primary data obtained directly from respondents (MSME owners/managers) through questionnaires. Primary data was selected to obtain up-to-date information on the level of Digital Skills and Marketing Performance, in line with perceptions and real-world conditions. Each statement is measured using a 5-point Likert scale, with the following categories:

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Neutral
- 4 = Agree
- 5 = Strongly Agree

Research Variables and Operational Definitions

Digital Skill (X)

Digital skill is an employee's ability to utilize digital technology to support the effectiveness and efficiency of work completion.

Digital Skill Indicators:

1. Ability to operate digital devices
2. Ability to use work applications
3. Ability to manage digital information (market research)
4. Adaptation to new technology
5. Technology-based problem solving

Marketing Performance (Y)

Marketing Performance is the level of marketing results achieved by MSMEs based on established business standards and targets.

Marketing Performance Indicators:

1. Marketing quality (content quality and brand appeal).
2. Marketing quantity (sales volume and customer reach).
3. Timeliness (speed of response to market trends and orders).
4. Marketing effectiveness (achievement of marketing targets compared to costs/efforts).
5. Marketing responsibility (accountability in service and business integrity).

Data Analysis Techniques

1. Outer Model (Measurement Model)

The outer model evaluation aims to test the extent to which the indicators used are able to measure the latent construct validly and reliably. The outer model evaluation in this study includes Convergent Validity, Construct Reliability, and Discriminant Validity.

a. Convergent Validity, Construct Reliability, and Validity

Convergent validity is used to assess the level of correlation between indicators and the latent constructs they measure. Convergent validity testing is conducted by considering the outer loading and Average Variance Extracted (AVE) values.

The criteria for convergent validity testing are as follows:

- Outer loading value ≥ 0.70
- AVE value ≥ 0.50

Indicators with outer loading values below 0.70 can be considered for elimination if they do not support the quality of construct measurement.

In addition to convergent validity, construct reliability and validity testing are conducted to ensure the internal consistency of the indicators in measuring the latent construct. This test is conducted by examining the following values:

- Cronbach's Alpha ≥ 0.70
- Composite Reliability ≥ 0.70

A construct is considered reliable and valid if it meets all of these criteria, indicating that the indicators are able to measure the construct consistently and accurately.

b. Discriminant Validity

Discriminant validity aims to ensure that each construct in the research model is clearly distinct and does not overlap. Discriminant validity testing in this study was conducted using two approaches:

1) Heterotrait – Monotrait Ratio (HTMT)

The HTMT value is used to assess the level of similarity between constructs. A construct is considered to have discriminant validity if the HTMT value is <0.90 .

2) Fornell–Larcker Criterion

This test is conducted by comparing the square root of the AVE value for each construct with the correlation values between the other constructs. Discriminant validity is met if the square root of the AVE of a construct is greater than its correlation with other constructs.

2. Inner Model (Structural Model)

The inner model evaluation aims to test the causal relationships between latent variables and the predictive ability of the research model. The inner model evaluation includes R-squared (R^2), F-squared (f^2), Q-squared (Q^2), and Path Coefficient.

a. R-squared (R^2)

The R Square (R^2) value shows the magnitude of the variation in the dependent variable Marketing Performance that can be explained by the independent variable Digital Skill. The interpretation of the R^2 value is as follows:

- $R^2 \geq 0.75$ indicates a strong model
- $R^2 \geq 0.50$ indicates a moderate model
- $R^2 \geq 0.25$ indicates a weak model

b. F-squared (f^2)

The F Square (f^2) value is used to measure the magnitude of the influence of the Digital Skill variable on Marketing Performance in the structural model. The criteria for interpreting the f^2 value are:

- 0.02 indicates a small effect
- 0.15 indicates a moderate effect
- 0.35 indicates a large effect

c. Q-Square (Q^2)

The Q-Square (Q^2) value is obtained through a blindfolding procedure and is used to assess the predictive ability of the research model. The model is considered to have good predictive relevance if the Q^2 value is greater than zero ($Q^2 > 0$).

d. Path Coefficient

The path coefficient is used to test the direction and significance of the influence between latent variables. Significance testing is performed through a bootstrapping procedure, with the following criteria:

- T-statistic > 1.96
- P-value < 0.05

The results of the path coefficient test are used as the basis for determining whether to accept or reject the research hypothesis.

Hypothesis Testing

The hypothesis tested in this study is:

H1: Digital skills have a positive and significant effect on marketing performance.

The hypothesis is accepted if the analysis results show a T-statistic greater than 1.96 and a P-value less than 0.05.

IV. Results and Discussion

Outer Model

Outer model evaluation is conducted to ensure that the research indicators accurately and consistently measure the latent constructs. According to (Hair et al., 2022), measurement model assessment in PLS-SEM includes tests of convergent validity, construct reliability and validity, and discriminant validity. These tests aim to assess the level of fit between the indicators and their constructs, the internal consistency of the measurements, and the clarity of the differences between constructs in the research model. This ensures that the results of the structural analysis can be interpreted reliably and scientifically justified.

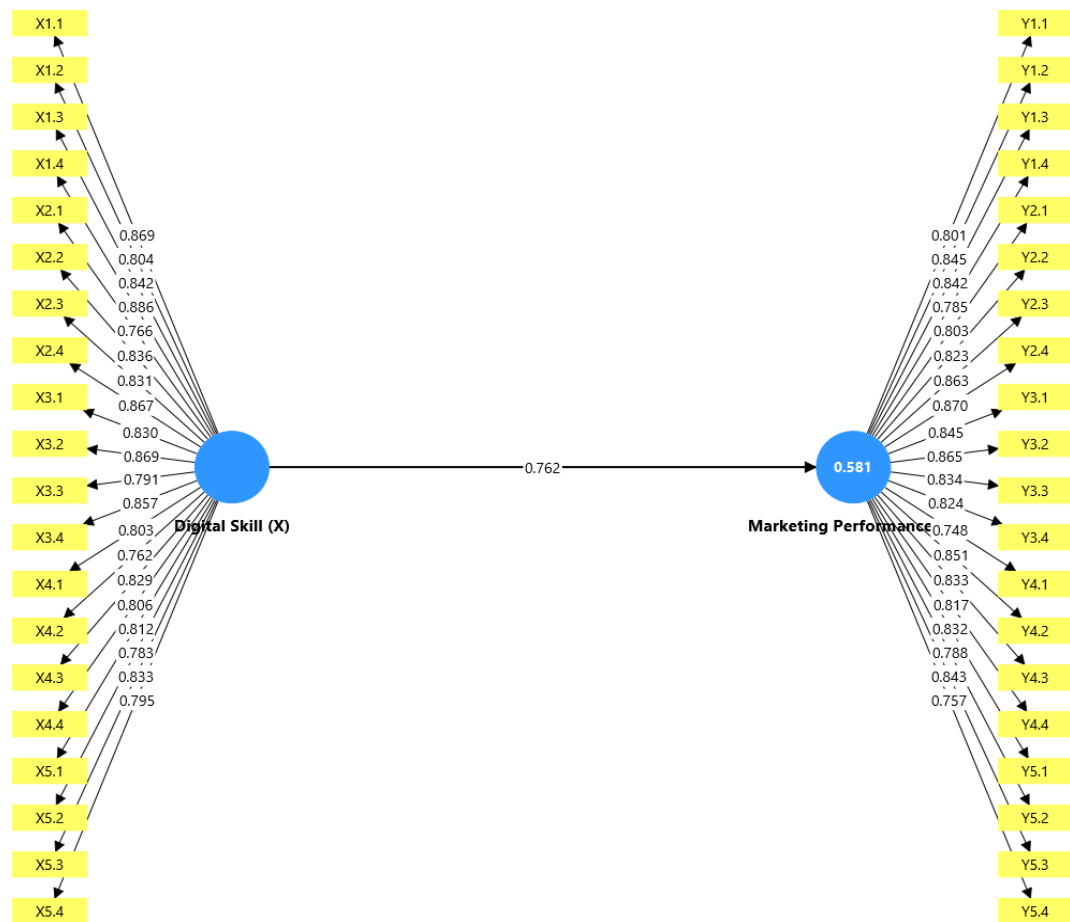


Figure 1. Outer Model

Table 1
Convergent Validity & Construct Reliability and Validity

Variable	Indicator	Outer Loading	Cronbach's Alpha	Composite Reliability (rhoa)	Composite Reliability (rhoc)	AVE
Digital Skill (X)	X1.1	0.869	0.975	0.976	0.977	0.679
	X1.2	0.804				
	X1.3	0.842				
	X1.4	0.886				
	X2.1	0.766				
	X2.2	0.836				
	X2.3	0.831				
	X2.4	0.867				
	X3.1	0.830				
	X3.2	0.869				
	X3.3	0.791				
	X3.4	0.857				
	X4.1	0.803				
	X4.2	0.812				
	X4.3	0.833				
	X4.4	0.795				
	X5.1	0.762				
	X5.2	0.829				
	X5.3	0.806				
	X5.4	0.812				

Variabel	Indicator	Outer Loading	Cronbach's Alpha	Composite Reliability (rhoa)	Composite Reliability (rhoc)	AVE
Marketing Performance (Y)	X4.1	0.803	0.975	0.976	0.977	0.679
	X4.2	0.762				
	X4.3	0.829				
	X4.4	0.806				
	X5.1	0.812				
	X5.2	0.783				
	X5.3	0.833				
	X5.4	0.795				
	Y1.1	0.801				
	Y1.2	0.845				
	Y1.3	0.842				
	Y1.4	0.785				
	Y2.1	0.803				
	Y2.2	0.823				
	Y2.3	0.863				
	Y2.4	0.870				
	Y3.1	0.845				
	Y3.2	0.865				
	Y3.3	0.834				
	Y3.4	0.824				
	Y4.1	0.748				
	Y4.2	0.851				
	Y4.3	0.833				
	Y4.4	0.817				
	Y5.1	0.832				
	Y5.2	0.788				
	Y5.3	0.843				
	Y5.4	0.757				

Based on the results of the outer model evaluation, all indicators in the Digital Skill (X) and Marketing Performance (Y) variables have outer loading values in the range of 0.748–0.886, which have met the minimum criteria of > 0.70 as recommended by Hair et al., (2022), so that each indicator is declared valid in representing its construct. Furthermore, the construct reliability shows excellent results, indicated by the Composite Reliability rhoa and rhoc values of 0.976 and 0.977, respectively, which have exceeded the feasibility limit of > 0.70 , indicating a very high level of internal consistency. In addition, the Cronbach's Alpha value of 0.975 is also above the threshold of > 0.70 , thus strengthening evidence of measurement reliability. In terms of convergent validity, the Average Variance Extracted (AVE) value of 0.679 has met the criteria of > 0.50 , indicating that the construct is able to explain more than half of the

variance of its indicators. Thus, all constructs in this study are declared valid and reliable, so they are suitable for use in further structural model testing.

Table 2
Discriminant Validity

<i>Heterotrait-Monotrait Ratio of Correlations</i>		
	Digital Skill (X)	Marketing Performance (Y)
Digital Skill (X)		
Marketing Performance (Y)	0.780	
<i>Fornel Larcker Criterion</i>		
	Digital Skill (X)	Marketing Performance (Y)
Digital Skill (X1)	0.824	
Marketing Performance (Y)	0.762	0.824

Based on the results of the discriminant validity test, the Heterotrait–Monotrait Ratio (HTMT) value between the Digital Skill (X) and Marketing Performance (Y) constructs was 0.780, which is below the maximum limit of 0.85, indicating that the two constructs have an adequate level of difference. Furthermore, based on the Fornell–Larcker criteria, the square root of the AVE value for each construct (0.824) is greater than the correlation value between constructs (0.762), indicating that each construct is able to explain the variance of its indicators better than the variance explained by other constructs. Thus, it can be concluded that the measurement model in this study has met the criteria for discriminant validity and all constructs are stated to be conceptually different from each other in accordance with the recommendations of Hair et al., (2022)

Inner Model

Inner model evaluation is conducted to assess the causal relationships between latent constructs in the research model. Referring to Hair et al., (2022), structural model assessment in PLS-SEM includes testing the path coefficient, significance value (t-statistic and p-value), coefficient of determination (R^2), and effect size (effect size f^2 and predictive relevance Q^2). This evaluation aims to determine the strength, direction, and predictive ability of the relationships between variables, thereby ensuring that the constructed structural model has a sufficient level of feasibility and explanatory power to support the testing of research hypotheses.

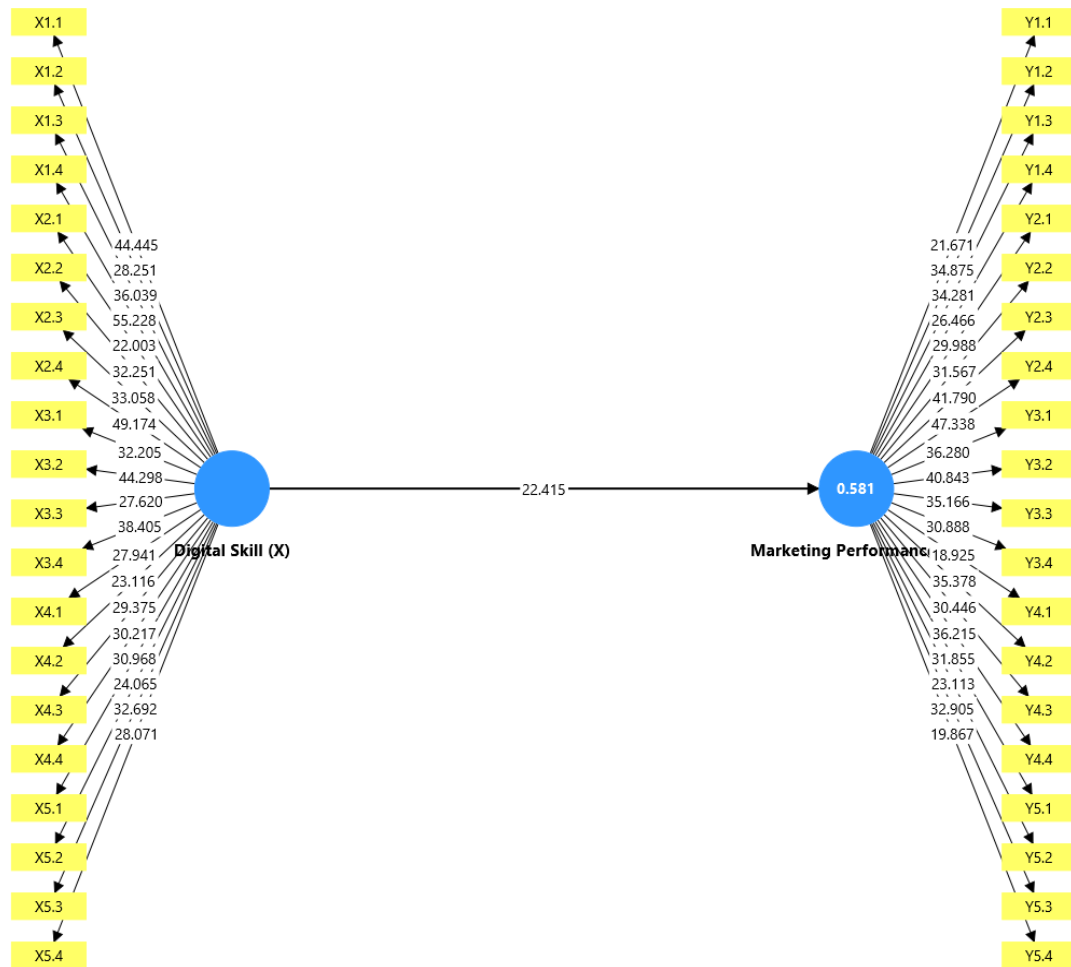


Figure 2. Inner Model

Table 3
R Square, F Square, Q Square

<i>R Square</i>		
	<i>R-square</i>	<i>R-square adjusted</i>
Marketing Performance (Y)	0.581	0.578
<i>Q Square</i>		
	Digital Skill (X)	Marketing Performance (Y)
Digital Skill (X)		1.386
Marketing Performance (Y)		
<i>Q Square</i>		
	<i>Q² predict</i>	
Marketing Performance (Y)	0.572	

Based on the inner model evaluation, the R-square value for the Marketing Performance (Y) variable is 0.581 with an adjusted R-square of 0.578, indicating that 58.1% of the variation in Marketing Performance can be explained by the predictor variables in the model, while the remaining 41.9% is influenced by other factors outside the model. Furthermore, the Q² results show a Q²predict value for Marketing Performance (Y) of 0.572 (greater than 0), so the model has good predictive relevance in predicting Marketing Performance. In addition, the value in the Q Square matrix

shows a predictive contribution of the Digital Skill (X) construct to Marketing Performance (Y) of 1.386, which confirms that the predictor provides strong predictive power against the endogenous variables in the research model.

Table 4
Path Coefficient

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
Digital Skill (X) → Marketing Performance (Y)	0.762	0.765	0.0034	22.415	0.000

Based on the results of the path coefficient test, the Digital Skill (X) variable has a positive and significant influence on Marketing Performance (Y), as indicated by the path coefficient value of 0.762. This result is supported by the t-statistic value of 22.415, which far exceeds the critical limit of 1.96, and the p-value of 0.000 (<0.05), so that the influence is declared statistically significant. Thus, increasing employee digital skills significantly contributes to increasing Marketing Performance, so the hypothesis stating that there is an influence of Digital Skill on Marketing Performance can be accepted.

V. Conclusion

Based on the research results and data analysis using the Structural Equation Modeling-Partial Least Squares (SEM-PLS) method on 170 MSME respondents in Surabaya, it can be concluded that the research model developed meets the feasibility criteria in terms of both the measurement model (outer model) and the structural model (inner model).

The outer model evaluation results indicate that all indicators in the Digital Skills and Marketing Performance variables have outer loading values above 0.70, Average Variance Extracted (AVE) values above 0.50, and Cronbach's Alpha and Composite Reliability values above 0.70. This confirms that all constructs in this study are valid and reliable in measuring the variables studied.

Furthermore, the results of discriminant validity tests using the Heterotrait–Monotrait Ratio (HTMT) and Fornell–Larcker Criterion approaches indicate that each construct has an adequate level of differentiation and is conceptually distinct. Thus, it can be concluded that the research instrument accurately measured Digital Skill and Marketing Performance variables, with no overlap between constructs.

The inner model evaluation results indicate that Digital Skill has a strong ability to explain variations in Marketing Performance. The coefficient of determination (R^2) of 0.581 indicates that 58.1% of the variation in Marketing Performance can be explained by Digital Skill, while the remainder is influenced by factors outside the research model. Furthermore, the Q^2 predict value, which is greater than zero, indicates that the model has good predictive relevance in predicting MSME marketing performance.

Path coefficient testing demonstrated a positive and significant effect of Digital Skill on Marketing Performance, with a path coefficient of 0.762, a t-statistic of 22.415, and a p-value of 0.000. These results confirm that the higher the digital skills possessed by MSMEs, including the ability to operate digital devices, use marketing applications, manage digital information, adapt to new technologies, and solve technology-based business problems, the higher their Marketing Performance, as demonstrated by the quality of their strategies, sales volume, timely market response, marketing effectiveness, and professional responsibility.

Therefore, the research hypothesis stating that Digital Skills have a positive and significant impact on Marketing Performance is accepted. This study confirms that Digital Skills are a strategic competency in marketing management in the era of digital transformation and are a crucial factor that requires serious attention from MSMEs and stakeholders in Surabaya to sustainably improve Marketing Performance.

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