

The Influence of Digital Marketing and Product Innovation on Marketing Performance with Government Support as a Moderating Variable: A Study on Micro Culinary Enterprises in Depok City

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Abstract

This study aims to analyze the influence of digital marketing and product innovation on the marketing performance of micro culinary businesses in Depok City, with government support as a moderating variable. The background of this research stems from the importance of optimizing digital-based marketing strategies and product innovation to enhance MSME competitiveness, especially amid high market competition and changing consumer behavior. This research employed a quantitative methodology, utilizing surveys to collect data from 101 micro culinary business owners who were chosen using purposive sampling techniques. The data was analyzed through Structural Equation Modeling using the Partial Least Squares method via SmartPLS software. Findings revealed that digital marketing significantly and positively influences marketing performance, demonstrated by a path coefficient of 0.554. However, product innovation did not demonstrate a statistically significant impact on marketing performance. Additionally, government support failed to serve as a meaningful moderator in the relationships between both digital marketing and product innovation with marketing performance outcomes. Overall, the model explains 38.6% of the variation in marketing performance. These findings indicate that digital marketing strategy is a key factor in improving MSME marketing performance, while the role of product innovation and government intervention has not yet provided strong statistical contribution in the context of this study.

Keywords: Culinary MSMEs, Digital Marketing, Government Support, Marketing Performance, Product Innovation.

1. Introduction

MSMEs play a crucial role in the country's economy by creating employment opportunities and stimulating economic development. According to statistics provided by the Ministry of Cooperatives and SMEs in 2023, Indonesia is home to 65.5 million MSMEs, which account for 61% of the national GDP and employ 97% of the working population. However, the dominance of micro enterprises (99.6%) reflects structural problems called the missing middle (ukmindonesia.id, 2024). In facing marketing challenges, digitalization becomes both an opportunity and a challenge. According to Pratiwi & Ratnawati (2024), promotion is no longer the main obstacle, but rather increasingly fierce competition. Muis et al. (2024) affirms that digital marketing can significantly improve MSME marketing performance. Radhiana



(2023) adds that more than 100 million active smartphone users in Indonesia show great potential for technology-based promotion.

APJII (2024) notes that the majority of internet users in Indonesia are Generation Z (34.4%) and millennials (30.6%), with urban area dominance (69.5%). Globally, 70.3% of the world's population has used mobile phones, and 67.5% are connected to the internet (We Are Social, 2024). Even 48% of internet users in Indonesia have actively searched for products or services online (We Are Social, 2017). According to Fanreza & Kramadibrata (2022), digital marketing provides MSMEs with advantages in the form of low costs, wide reach, and human resource efficiency. However, only 26% of total Indonesian MSMEs have entered the digital ecosystem (Ministry of Communication and Information, 2024). Therefore, MSME digitalization is a crucial step in boosting competitiveness and contribution to the national economy.

According to a survey conducted by Depok Digital Center in 2023, the majority of MSMEs in Depok have utilized social media for marketing (70%). However, only 25% use business management software such as Point of Sale (POS) to support their operations. According to Wijaya et al. (2024), although social media is widely used, only about 10% of Depok MSMEs utilize digital marketing through marketplaces like Tokopedia and Shopee. The low use of digital marketing among micro-scale entrepreneurs is due to limited human resources and production and marketing processes being carried out independently without worker assistance. In addition to implementing digital marketing, MSMEs must also improve product quality by conducting product innovation. According to Batoebara (2021), product innovation is part of efforts to encourage improved MSME performance. Product innovation shows the existence of uniqueness created in products that differentiates them from other products (Fatimah et al., 2024). Product innovation can be done on product form, content, and even packaging. Successful product innovation will create competitive advantages that will drive increased sales and customer growth. If this can be realized, then marketing performance will improve.

As outlined by Avriyanti (2022), product innovation capability is very important in improving marketing performance. Companies that continuously create and offer new ideas, and utilize technology to develop products, tend to have better marketing performance. However, Muis et al. (2024) reveal that innovation does not have a direct impact on marketing performance. However, research results conducted by Simarmata & Sefnedi (2024) show that product innovation drives improved MSME marketing performance. The importance of innovation capability in production is also needed by MSME entrepreneurs, as expressed by Nur'aeni (2021) that production innovation will be able to improve MSME performance. Therefore, research discussing the influence of product innovation on MSME marketing performance is certainly still interesting to study. Based on previous research conducted on MSMEs in Depok City, Lubis (2024) stated that many business actors in Depok City still rely on old products that are not adapted to current market trends. As a result, product attractiveness tends to decline, and MSME actors experience difficulties in increasing sales and market share. Therefore, MSME actors are expected to innovate their products. Effective product innovation enables MSMEs to build strong differentiation thereby increasing product competitiveness.

In other marketing performance research, there is a variable of government role. Government support is a crucial factor in supporting MSME product development. According to the Ministry of Cooperatives and SMEs (2023), through various programs such as entrepreneurship training, capital access, and marketing facilitation, the government can help MSMEs improve their capacity and competitiveness. This statement is also supported by

Siregar & Jaffisa (2020) that the government's role in supporting marketing performance improvement through education, training, and regulation affects business progress.

According to research by Tirtayasa & Daulay (2021), government programs that focus on improving MSME innovation and digitalization skills have a positive impact on MSMEs' ability to develop new products. According to Jasra et al. (2011), government support is one of the determining factors for MSME success. Wang et al. (2023) stated that marketing strategies are more effective with government support. However, in research by Martínez-López et al. (2024) opined that government support affects marketing performance but is not significant.

The government has an important role in supporting MSME marketing through goods/services procurement policies, as stated in Article 97 of the Job Creation Law which mandates a minimum allocation of 40% for MSME and cooperative products (Law Number 11 of 2020). In Depok City, local government support is reflected through Depok Mayor Regulation No. 40/2023 regarding the New Entrepreneur Program which targets the addition of 2,200 new micro entrepreneurs through training, mentoring, and market access provision through cooperation with modern retail (Lubis, 2024). However, although the number of micro entrepreneurs has increased, there is no significant increase in small-medium enterprises. Most MSME actors still rely on bazaars as their main marketing strategy, which shows low marketing performance and dependence on government intervention (DepokNews, 2024). The Depok City Cooperative and SME Office also encourages MSME digitalization so they do not just rely on conventional methods.

Data from www.umkmdkerens.depok.go.id shows that 88% of Depok's micro businesses are in the culinary sector. From a survey of 29 culinary business actors, 65.5% rated their sales achievement as only "adequate," and 24.1% rated it as "low" to "very low," reflecting weak marketing performance. This is reinforced by BPS (2024) data which recorded a decrease in culinary sector economic growth of 0.21% compared to the previous year. Based on theoretical descriptions and findings from previous research, researchers are interested in conducting research that discusses marketing performance. This research is a development of Indra Muis's research conducted on micro-scale food and beverage entrepreneurs in Bekasi, but the researcher added a government support variable as moderation.

2. Methods

2.1. Research Design

This study employs quantitative data collected through questionnaires distributed to micro culinary businesses in Depok City and utilizes descriptive statistical analysis. The approach taken is quantitative in nature, focusing on a case study of the micro culinary sector businesses in Depok City with government involvement. Sparse Partial Least Squares (sPLS) is the statistical method utilized in this research. sPLS is a multivariate analysis technique that is commonly used in statistical modeling, specifically in regression and principal component analysis (PCA) scenarios. sPLS is a modified version of the Partial Least Squares (PLS) method designed to tackle issues related to multicollinearity and high-dimensionality in data analysis.

2.2. Variable Operationalization

Variable operationalization is conceptualizing and defining research variables so they can be measured or observed concretely.

Table 1. Variable Operationalization

Variable	Dimension	Indicator	Source
Marketing Performance (Variable Y)	Financial Aspect	1. Sales Volume	Zuliasanti et al. (2020)
		2. Profit	
	Non-Financial Aspect	1. Customer Growth	
2. HR Addition			
3. Asset Addition			
Digital Marketing (Variable X1)	Informativeness	1. Clear and complete product information	
		2. Cost Efficiency	
	Interactivity	1. Digital partnerships	
		2. Effective customer communication	
Trendiness	1. Sales Increase		
	2. Attractive sales design		
	3. Consistent social media account management		
Product Innovation (Variable X2)	Innovation Culture	1. Routine creation	Kotler & Armstrong (2011)
		2. Providing space for customer criticism/suggestions	
	Technical Innovation	1. Product quality improvement	
2. Adding product variants			
3. Changing product design to be attractive			
Government Support (Variable Z)	Policy/Regulation	1. Local regulation establishment	
		2. Clear and easy licensing	
		3. Legal protection	
	Financial Assistance/Subsidy	1. Easy capital access	
2. Financing support, soft loans, grants			
Training and Development		1. Digital marketing education, product photography training	
		2. Business mentoring	

2.3. Data Sources

This study utilizes primary and secondary data sources. For the primary data, questionnaires were distributed to micro culinary business owners in Depok City. Secondary sources are obtained from scientific journals, reference books, publication materials. In addition to this data, there is also data sourced from regional regulations (Perda) and policies established by the Depok City government.

2.4. Research Population and Sample

The population in this study is micro culinary business actors domiciled in Depok City, West Java. The population number in this study is 11,825 people.

This research sample uses purposive sampling technique, which is sampling by selecting respondents based on certain considerations. Sample respondents taken are expected to represent the overall population condition. The following are the sample respondent criteria in this study:

- a. Have Depok ID card and domiciled in Depok
- b. Have culinary business (food or beverage)
- c. Have business turnover of maximum 2 billion
- d. Minimum operational duration of 1 year

In this study, the author narrows the population by calculating sample size using Taro Yamane calculation formula according to Riduwan (2015). Because in sampling, the number

must be representative so that research output can be generalized and calculations do not require sample number tables, but can be done using formulas and simple calculations. Taro Yamane formula to determine samples. In this study, researchers will take a sample of at least 100 people.

2.5. Data Collection Method

Data collection method will be conducted through questionnaire distribution that will be distributed to micro entrepreneurs per village through WhatsApp groups, thus facilitating researchers in sample collection.

2.6. Data Analysis Method

The study utilizes SmartPLS SEM software for data analysis. This software, PLS, is effective in elucidating the connections between variables and can perform analyses in a single test. According to Hair et al. (2014), Structural Equation Modeling (SEM) is a method that enables the exploration of distinct connections among various sets of dependent variables. In simpler terms, structural equation modeling offers optimal and efficient estimation methods for a collection of distinct multiple regression equations that are analyzed simultaneously.

3. Results and Discussion

3.1. Research Results

3.1.1. Respondent Characteristics

Within two weeks, this study successfully collected data from 101 respondents. The study questionnaire was efficiently distributed through the WhatsApp platform, enabling accurate targeting of relevant audiences. The respondent participation rate reached 100%, indicating full involvement from all selected samples. Inclusion criteria for participants included domicile in Depok City, ownership of culinary business (food or beverage), annual business turnover of maximum two billion rupiah, and minimum business operational duration of one year. The effectiveness of the distribution method and sample responsiveness ensures comprehensive data completeness.

1) Respondent Characteristics by Age

Table 1. Respondent Characteristics by Age

Age	n (Number)	% (Percentage)
Less than 20 years old	1	0.99
20 - 35 years old	9	8.91
35 - 45 years old	34	33.66
More than 45 years old	57	56.44
Total	101	100

Source: Primary data processed, 2025

The table of respondent characteristics by age shows a diverse distribution of micro culinary business actors in Depok City who are the research objects. Of the total 101 respondents, most are in the productive to senior age categories. The "More than 45 Years" age group dominates with 57 respondents, representing 56.44% of the total. This shows that the majority of micro culinary business actors in Depok in this sample are individuals who have life experience and possibly also longer business experience.

The 35-45 Years age group also has significant contribution with 34 respondents or 33.66% of the total. If combined with the More than 45 Years age group, then more than 90%

of respondents are individuals aged 35 years and above. This indicates that the micro culinary business sector in Depok tends to be pursued by individuals who have reached age maturity and possibly stability in entrepreneurship.

On the other hand, younger age groups, namely 20-35 Years and Less than 20 Years, have much smaller representation. The 20-35 Years age group consists of only 9 respondents (8.91%), while the Less than 20 Years category has only 1 respondent (0.99%). The low number of respondents from young people can indicate that young generation involvement in micro culinary businesses in Depok, at least based on this sample, is still relatively minimal compared to more mature age groups. This finding is important to consider in analyzing the influence of digital marketing and product innovation, given that technology preferences and adaptation may differ across age groups.

2) Respondent Characteristics by Gender

Table 2. Respondent Characteristics by Gender

Gender	n (Number)	% (Percentage)
Male	6	5.94
Female	95	94.06
Total	101	100

Source: Primary data processed, 2025

Table 2 shows respondent characteristics by gender in research on the influence of digital marketing and product innovation on marketing performance in micro culinary businesses in Depok City. Data obtained from 101 respondents shows a very significant disparity between the number of male and female respondents. The vast majority of respondents are female, affirming the dominance of women's roles in the micro culinary business sector in the study area.

Specifically, of the total 101 respondents, 95 respondents (94.06%) are female. This figure clearly indicates that women are the main backbone in running micro culinary businesses in Depok City. This phenomenon aligns with general trends in Indonesia, where micro businesses, especially in the culinary and processed food sectors, are often driven by housewives or female entrepreneurs who utilize cooking and entrepreneurial skills.

On the other hand, the number of male respondents is very minimal, only 6 respondents or equivalent to 5.94% of the total. The low male participation in this sample shows that micro culinary businesses in Depok, based on this data, tend to be less attractive or less significantly pursued by men compared to women. This finding provides a strong demographic picture of who actually runs micro culinary businesses in Depok, and can be an important consideration in further analysis regarding marketing strategies or government support that may have different impacts based on gender.

3.1.2. Convergent Validity Test

Convergent validity testing is conducted by evaluating two main components: Average Variance Extracted (AVE) and outer loading. AVE functions to measure the proportion of variance that can be explained by indicators in a construct, while outer loading assesses the strength of the relationship between each indicator and the latent variable being measured. High AVE values indicate that these indicators effectively capture most of the variance from the latent construct. By ensuring both components meet established criteria, researchers can be confident that the research instrument has strong convergent validity, so study results can be considered reliable and relevant.

Table 3. Average Variance Extracted (AVE) Results

Variable	Average Variance Extracted (AVE)	Standard	Criteria
Digital Marketing	0.597	>0.50	Valid
Product Innovation	0.736	>0.50	Valid
Government Policy	0.611	>0.50	Valid
Marketing Performance	0.713	>0.50	Valid

Source: Primary data processed, 2025

Table 3 displays the Average Variance Extracted (AVE) test results for all variables in this study: Digital Marketing, Product Innovation, Government Policy, and Marketing Performance. AVE testing aims to evaluate the extent to which indicators in a construct can explain variance from its latent construct. AVE success criteria must be greater than 0.50 (>0.50), indicating that more than 50% of construct variance is explained by its indicators.

Based on the table, it can be seen that all research variables have met convergent validity criteria based on AVE values. Digital Marketing variable has an AVE value of 0.597, Product Innovation of 0.736, Government Policy of 0.611, and Marketing Performance of 0.713. All these values are consistently above the 0.50 threshold, indicating that each indicator used to measure each variable has effectively captured variance from the intended latent construct.

High AVE values, especially in Product Innovation (0.736) and Marketing Performance (0.713) variables, indicate that measurement instruments for both variables are very strong in representing their constructs. This means that question items designed to measure product innovation and marketing performance have very good alignment in reflecting the concepts to be measured, so that collected data is relevant and accurately represents.

Overall, this AVE analysis result confirms that the measurement model used in this study has good convergent validity. This validity is essential to ensure that research instruments are valid in measuring the studied constructs. Thus, it can be concluded that indicators used for Digital Marketing, Product Innovation, Government Policy, and Marketing Performance variables accurately reflect their theoretical constructs, providing a strong foundation for subsequent analysis in hypothesis testing.

3.1.3. Structural Model Testing

Structural model testing focuses on identifying and evaluating the significance of relationships between variables. This process involves multicollinearity tests, determination of coefficient of determination (R^2), and effect size calculations.

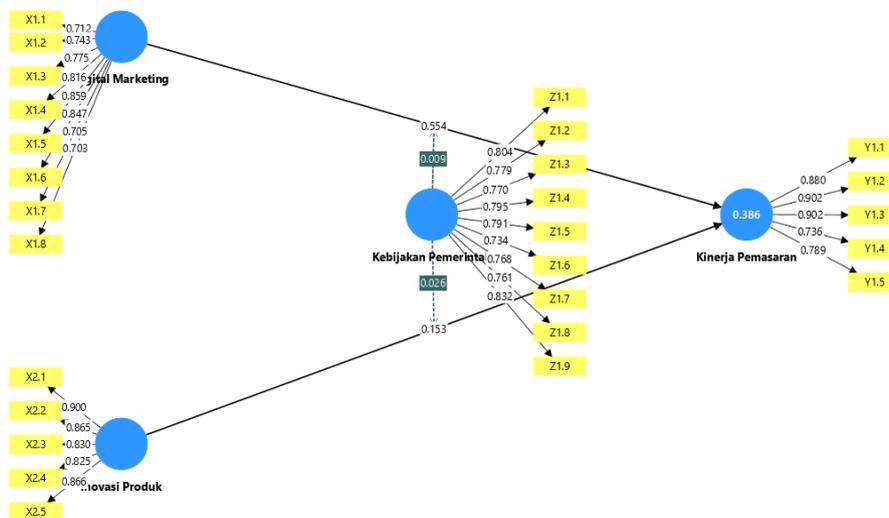


Figure 1. Structural Model Testing Results

Source: Primary data processed, 2025

Structural model testing, visualized in Figure 1, aims to evaluate hypotheses of causal relationships between latent constructs and identify the significance level of these influences. This model examines the effects of Digital Marketing and Product Innovation on Marketing Performance, with Government Support as a moderating variable. The path coefficients displayed on the arrows represent the strength and direction of the hypothesized relationships, while the R² values on the dependent variable indicate the proportion of variance explained by the predictor variables.

Analysis of direct paths shows that Digital Marketing has a positive and substantial influence on Marketing Performance, indicated by a path coefficient of 0.554. The magnitude of this coefficient suggests that digital marketing implementation strongly correlates with improved marketing performance in culinary micro-enterprises. Meanwhile, Product Innovation also shows a positive influence on Marketing Performance, albeit with a smaller path coefficient of 0.153. This indicates that product innovation efforts contribute positively, but with lower intensity compared to digital marketing in improving marketing performance. The statistical significance of both direct effects, essential for hypothesis acceptance, will be confirmed through p-values or t-statistics from complementary bootstrapping results.

A crucial aspect of this model is the role of Government Policy as a moderating variable. The figure displays two interaction effects: first, between Digital Marketing and Marketing Performance moderated by Government Policy, with an interaction coefficient of 0.009. Second, between Product Innovation and Marketing Performance moderated by Government Policy, with an interaction coefficient of 0.026. These relatively small interaction coefficients indicate that although there are indications of positive moderation (if significant), their effects on the strength of direct relationships may not be substantial. Definitive interpretation of whether Government Policy significantly moderates these relationships depends heavily on significance test results (p-value or t-statistics) from each interaction coefficient.

Finally, the model's ability to explain variance in the dependent variable is indicated by the R² value for Marketing Performance of 0.386. This figure means that approximately 38.6% of the total variance in Marketing Performance can be explained collectively by Digital Marketing, Product Innovation, and the moderating effects of Government Policy. An R² value of 0.386 is generally categorized as moderate in social science research contexts, indicating that this model has good predictive capacity, although other factors outside the model still influence Marketing Performance. Evaluation of Q² values will also complement the assessment of the model's predictive relevance.

3.1.4. Multicollinearity Testing

Diagnostic criteria for multicollinearity are based on two indicators: Variance Inflation Factor (VIF) values above 10 or tolerance values below 0.1 indicate the presence of multicollinearity; conversely, VIF less than 10 and tolerance above 0.1 show that this problem does not occur.

Table 4. Multicollinearity Test Results

Path	VIF
Digital Marketing → Marketing Performance	2.663
Product Innovation → Marketing Performance	2.072
Government Policy → Marketing Performance	2.116
Government Policy × Digital Marketing → Marketing Performance	2.339
Government Policy × Product Innovation → Marketing Performance	2.120

Source: Primary data processed, 2025

Multicollinearity testing is an essential prerequisite in SEM-PLS based regression analysis to ensure there is no excessive linear correlation between predictor variables in the model. The presence of high multicollinearity can result in bias in path coefficient estimates and increase standard errors, thereby reducing the reliability of statistical inference. The common criterion used to detect multicollinearity is a Variance Inflation Factor (VIF) value less than 10 (<10), which indicates that multicollinearity problems do not occur in the tested variables.

Table 4 displays VIF values for each predictor variable leading to Marketing Performance, including main independent variables and moderating variables, as well as their interactions. For direct effects, Digital Marketing has a VIF value of 2.663, Product Innovation of 2.072, and Government Policy of 2.116. All these VIF values are significantly smaller than the threshold of 10, indicating that there are no multicollinearity problems in these independent variables when tested individually in the predictive model for Marketing Performance.

Furthermore, testing also includes variables representing moderating interaction effects. The interaction variable "Government Policy × Digital Marketing" has a VIF value of 2.339, while "Government Policy × Product Innovation" has a VIF value of 2.120. Both VIF values for these interaction terms are also well below the threshold of 10. This is a crucial finding in moderation models, as interaction terms often become potential sources of high multicollinearity. The low VIF values for these interaction terms confirm that there are no significant multicollinearity issues due to the formation of moderating variables.

Overall, the multicollinearity test results show that all predictor variables in the structural model, both independent variables and interaction variables involving moderation, have VIF values well below the threshold of 10. This condition indicates that the research model is free from multicollinearity problems. Thus, the path coefficient estimates obtained from structural model testing can be considered stable, unbiased, and interpretable with high confidence, thereby strengthening the validity of inferences from the hypothesized relationships in this research.

3.1.5. Coefficient of Determination (R²) Results

Analysis of the coefficient of determination R², or adjusted R-squared, is applied to quantify the proportion of dependent variable variance that can be collectively explained by independent variables in the model (Ghozali, 2016). This test is crucial in evaluating the collective predictive efficacy of the set of predictors on the response variable. The coefficient of determination value ranges from 0 to 1. A value approaching 1 indicates that independent variables have substantial capability in explaining the majority of variation in the dependent variable. Conversely, a low R² value reflects the model's limitations in predicting or explaining fluctuations in the dependent variable (Ghozali, 2016).

Table 5. Coefficient of Determination (R²) Results

Variable	R-square	R-square adjusted
Marketing Performance	0.386	0.354

Source: Primary data processed, 2025

Testing the coefficient of determination (R²) is a fundamental evaluation in the structural model to measure the proportion of variance in the dependent variable that can be collectively explained by independent variables and moderating variables in the model. The R² value reflects the model's predictive strength, where higher values indicate that the model has greater ability to explain the phenomenon being studied. Besides R², Adjusted R-square

is also considered as a more conservative estimate useful for estimating model generalization to a broader population, especially in models with many predictors.

Based on Table 5, the Coefficient of Determination (R^2) value for Marketing Performance variable is 0.386. This figure indicates that approximately 38.6% of the total variance occurring in Marketing Performance can be explained by Digital Marketing constructs, Product Innovation, and moderating effects of Government Support. In the context of social science research, an R^2 value of 0.386 is generally categorized as moderate to fairly strong (Hair et al., 2017), showing that predictor variables in the model have significant contribution in explaining Marketing Performance variation in culinary micro-enterprises in Depok City.

3.1.6. Effect Size (f^2) Results

Effect size testing is conducted to quantify the magnitude of specific influence given by each predictor variable in a model. According to Hair et al. (2021), f^2 (f-square) values are indicators used to classify the strength of this influence into three categories: f^2 value of 0.02 indicates small effect; 0.15 shows medium effect; and 0.35 represents large effect. This analysis provides additional insights regarding the practical significance of identified relationships, beyond mere statistical significance.

Table 6. Effect Size (f^2) Results

Path	f-square
Digital Marketing → Marketing Performance	0.188
Product Innovation → Marketing Performance	0.018
Government Policy → Marketing Performance	0.003
Government Policy × Digital Marketing → Marketing Performance	0.000
Government Policy × Product Innovation → Marketing Performance	0.001

Source: Primary data processed, 2025

Effect size (f^2) testing is a crucial analysis in the structural model aimed at measuring the magnitude of substantive influence given by each exogenous variable on endogenous variables, complementing information from statistical significance. Based on Hair et al. (2021), the classification of effect strength is based on f^2 values: 0.02 for small effect, 0.15 for medium effect, and 0.35 for large effect. This analysis helps identify which variables have the most meaningful practical contribution to the dependent variable.

From Table 6, it can be observed that Digital Marketing → Marketing Performance shows an f^2 value of 0.188. This value is above the 0.15 threshold, so it can be categorized as having medium effect. This indicates that Digital Marketing not only has a statistically positive influence (if proven significant from hypothesis testing), but also has a fairly meaningful practical impact in explaining Marketing Performance variance. Furthermore, Product Innovation → Marketing Performance has an f^2 value of 0.018. This value approaches the 0.02 threshold, so it is categorized as having small effect. Although positive, the practical contribution of Product Innovation to Marketing Performance tends to be minor.

The moderating variable Government Policy when not interacting has an f^2 value of 0.003 on Marketing Performance. This value is very small, far below the small effect threshold (0.02), indicating that the direct effect of Government Policy on Marketing Performance, if any, is practically meaningless. This is consistent with its main role as a moderator rather than a direct predictor.

Furthermore, moderation effects are also evaluated. The interaction Government Policy × Digital Marketing → Marketing Performance shows an f^2 value of 0.000, and the interaction

Government Policy × Product Innovation → Marketing Performance shows an f^2 value of 0.001. Both values are very close to zero and far below the small effect threshold. This means that, practically, the role of Government Policy in moderating the relationship between Digital Marketing and Marketing Performance, as well as between Product Innovation and Marketing Performance, is very small or nonexistent. In other words, although statistically there may be an effect (which needs to be confirmed by p-value), its impact substantially on the strength of these relationships can be ignored. Overall, these f^2 test results highlight that Digital Marketing is the predictor with the most significant practical impact in this model.

3.1.7. Hypothesis Testing

Hypothesis testing in this research is designed to evaluate the existence and significance of independent variable influence on dependent variables. The testing procedure is conducted using Structural Equation Modeling - Partial Least Squares (SEM-PLS) method with a significance level of 5% ($\alpha=0.05$). The criteria for determining significance of an influence, referring to Hair et al. (2021), is when the obtained t-statistic value ≥ 1.96 and probability value (p-value) <0.05 . This estimation process involves bootstrapping techniques to generate t-statistics, p-values, and path coefficients for each variable relationship in the hypothesized model.

Table 7. Hypothesis Testing Results

Path	Path Coefficient	T statistics	P values	Conclusion
Digital Marketing → Marketing Performance	0.554	4.176	0.000	H supported
Product Innovation → Marketing Performance	0.153	1.094	0.274	H not supported
Government Policy → Marketing Performance	-0.063	0.505	0.614	H not supported
Government Policy × Digital Marketing → Marketing Performance	0.009	0.074	0.941	H not supported
Government Policy × Product Innovation → Marketing Performance	0.026	0.202	0.840	H not supported

Source: Primary data processed, 2025

Table 7 presents a summary of hypothesis testing results for each path relationship proposed in the research model. This testing is conducted using the SEM-PLS method with statistical significance criteria set at $\alpha=0.05$ level. Hypotheses are considered supported if t-statistic values ≥ 1.96 and p-values <0.05 , indicating that the observed influence is statistically significant and not occurring by chance. These results are crucial for verifying the theoretical validity of the proposed propositions.

First, the relationship between Digital Marketing → Marketing Performance shows a positive path coefficient of 0.554 with t-statistic value 4.176 and p-value 0.000. Since the t-statistic (4.176) is greater than 1.96 and p-value (0.000) is less than 0.05, the hypothesis stating that Digital Marketing has a positive and significant effect on Marketing Performance is supported. Conversely, the relationship between Product Innovation → Marketing Performance has a positive path coefficient of 0.153, but with t-statistic 1.094 and p-value 0.274. Since the t-statistic (1.094) is less than 1.96 and p-value (0.274) is greater than 0.05, this hypothesis is not supported, indicating that Product Innovation does not have a

statistically significant influence on Marketing Performance in this sample. Additionally, the direct influence of Government Policy → Marketing Performance is also not significant, with path coefficient -0.063, t-statistic 0.505, and p-value 0.614, so the hypothesis regarding this direct influence is not supported.

Furthermore, hypothesis testing results for moderation effects show that Government Policy does not significantly moderate the hypothesized relationships. For the interaction Government Policy × Digital Marketing → Marketing Performance, the interaction path coefficient is 0.009, with t-statistic 0.074 and p-value 0.941. Since the t-statistic (0.074) is less than 1.96 and p-value (0.941) is greater than 0.05, this moderation hypothesis is not supported. Similarly, the interaction Government Policy × Product Innovation → Marketing Performance has an interaction path coefficient of 0.026, t-statistic 0.202, and p-value 0.840.

For the same reason, this moderation hypothesis is also not supported. This indicates that government support, in the context of this model, does not significantly change or strengthen the relationship between digital marketing and marketing performance, nor between product innovation and marketing performance. Overall, these hypothesis testing results reveal that of all tested relationships, only Digital Marketing significantly and positively influences Marketing Performance in culinary micro-enterprises in Depok City.

The hypothesis proposing the influence of Product Innovation on Marketing Performance is not proven significant. Furthermore, the role of Government Support as a moderating variable on both relationships is also not proven significant. These findings provide important insights that although government support exists, its impact in moderating the influence of digital marketing and product innovation on marketing performance is not significant in the studied sample, showing that the effects of digital marketing and product innovation on marketing performance tend to be direct and not substantially influenced by government policies.

3.1.8. PLS Predict Results

PLS Predict is an evaluation methodology designed to assess the predictive capability of the hypothesized analysis model. The main metrics used in this assessment are Root Mean Square Error (RMSE) and Mean Absolute Error (MAE) values obtained from the PLS-SEM model. The criteria for successful predictive performance of the PLS-SEM model are met if its RMSE and MAE values are consistently lower compared to RMSE and MAE values generated by the Linear Model (LM). This condition indicates that the PLS-SEM model has superior predictive power, meaning it can predict the dependent variable with higher accuracy compared to the LM model (Hair et al., 2019).

Table 8. PLS Predict Results

Indicator	Q ² predict	PLS-SEM_RMSE	PLS-SEM_MAE	LM_RMSE	LM_MAE
Y1.1	0.277	0.879	0.728	0.911	0.730
Y1.2	0.230	0.904	0.760	0.956	0.767
Y1.3	0.296	0.816	0.675	0.853	0.688
Y1.4	0.123	1.073	0.855	1.173	0.926
Y1.5	0.088	1.091	0.836	1.112	0.867

Source: Primary data processed, 2025

PLS Predict testing aims to evaluate the predictive strength of the proposed structural model on dependent variable indicators. This evaluation is conducted by comparing Root Mean Square Error (RMSE) and Mean Absolute Error (MAE) values generated by the PLS-

SEM model with the same values from the Linear Model (LM) which serves as a comparison baseline. The criteria for predictive success is if RMSE and MAE values from PLS-SEM are lower compared to LM, showing that the PLS-SEM model has more accurate predictive ability (Hair et al., 2019). Additionally, Q^2 -predict values are also considered to assess the model's predictive relevance.

Table 8 presents PLS Predict results for each Marketing Performance variable indicator (Y1.1 to Y1.5). First, we observe Q^2 -predict values for each indicator. All indicators show Q^2 -predict values above zero (Y1.1 = 0.277, Y1.2 = 0.230, Y1.3 = 0.296, Y1.4 = 0.123, Y1.5 = 0.088). Positive Q^2 -predict values for all indicators indicate that the model has good overall predictive relevance, meaning the model can predict observational data from Marketing Performance indicators well.

Furthermore, comparison of RMSE and MAE values shows consistency in PLS-SEM model predictive strength. For indicator Y1.1, PLS-SEM_RMSE (0.879) is lower than LM_RMSE (0.911), and PLS-SEM_MAE (0.728) is lower than LM_MAE (0.730). Similar patterns are also seen in indicator Y1.2 (PLS-SEM_RMSE 0.904 < LM_RMSE 0.956; PLS-SEM_MAE 0.760 < LM_MAE 0.767) and Y1.3 (PLS-SEM_RMSE 0.816 < LM_RMSE 0.853; PLS-SEM_MAE 0.675 < LM_MAE 0.688). These results consistently show that the PLS-SEM model has superior predictive ability compared to the LM model for these three indicators.

However, for indicator Y1.4, although PLS-SEM_RMSE (1.073) is lower than LM_RMSE (1.173) and PLS-SEM_MAE (0.855) is lower than LM_MAE (0.926), the difference may not be as large as other indicators. Similarly, for Y1.5, PLS-SEM_RMSE (1.091) is lower than LM_RMSE (1.112) and PLS-SEM_MAE (0.836) is lower than LM_MAE (0.867). Nevertheless, the criteria that PLS-SEM_RMSE and PLS-SEM_MAE values are lower than the LM model are met for all Marketing Performance indicators. Overall, PLS Predict results convincingly confirm that the structural model proposed in this research has good predictive strength and can predict Marketing Performance indicators with higher accuracy compared to the benchmark model.

4. Conclusion

This research aims to analyze the influence of Digital Marketing and Product Innovation on Marketing Performance, with Government Support as a moderating variable, studying Culinary Micro-Enterprises in Depok City. Descriptive analysis results show that the majority of respondents are women and are in the productive to senior age category (above 35 years), indicating the dominance of mature age groups in this sector. Respondents' perceptions of Digital Marketing and Product Innovation are generally positive, with high means on most indicators, showing awareness and adoption of these practices in their business operations. Government Support is also perceived very positively, especially in terms of training and mentoring. Meanwhile, Marketing Performance shows positive perception in sales, profit, and customer growth aspects, but tends to be neutral on asset and workforce additions.

Measurement model testing confirms the validity and reliability of the instruments used. All indicators show loading factor values above 0.50, and Average Variance Extracted (AVE) values for all variables are above 0.50, proving strong convergent validity. Additionally, discriminant validity testing through Fornell-Larcker criteria is also met, indicating that each construct in the model has uniqueness and can be distinguished from other constructs. Reliability aspects also show very satisfactory results, with Cronbach's Alpha and Composite Reliability values for all variables well above the 0.70 threshold, confirming the consistency and reliability of research instruments.

Structural model testing results provide crucial insights regarding inter-variable relationships. It was found that Digital Marketing has a positive and significant influence on Marketing Performance, with path coefficient 0.554 and f^2 value of 0.188 indicating medium effect. This means that effective implementation of digital marketing strategies can substantially improve the marketing performance of culinary micro-enterprises. This finding is consistent with arguments that technological advances and increased internet users open great opportunities for SMEs to expand market reach and increase sales.

However, the hypothesis stating the influence of Product Innovation on Marketing Performance is not significantly supported, with path coefficient 0.153 and very small f^2 value (0.018). Although theoretically product innovation is expected to improve performance, in the context of this study, its practical contribution to culinary SME marketing performance in Depok tends to be minimal or not statistically significant. This may reflect that although product quality and design improvements are made, aspects of creating new products or adding variants regularly have not provided significant impact on overall marketing performance.

The moderation aspect of Government Support also shows non-significant results. The hypothesis stating that Government Support moderates the relationship between Digital Marketing and Marketing Performance is not supported, with interaction coefficient 0.009 and f^2 0.000. Similarly, moderation on the relationship between Product Innovation and Marketing Performance is not supported, with interaction coefficient 0.026 and f^2 0.001. This means that, although perceptions of government support are very positive, such support does not significantly strengthen or change the effects of Digital Marketing or Product Innovation on Marketing Performance. These effects tend to work directly without being substantially moderated by government intervention in the studied context.

Overall, the structural model shows that approximately 38.6% of Marketing Performance variance can be explained by Digital Marketing, Product Innovation, and moderating effects of Government Support variables, which is categorized as moderate predictive power. PLS Predict testing further confirms that the model has good predictive strength for Marketing Performance indicators, as RMSE and MAE values from PLS-SEM are consistently lower compared to LM model. These findings emphasize the importance of Digital Marketing as the main driver of culinary SME Marketing Performance in Depok City, while Product Innovation and Government Support have less significant roles in this model.

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