

Digital Adaptation Strategies for MSMEs in the Vuca Era: A Study of SMEs in Sukabumi City

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Abstract

This study aims to analyze in depth the influence of digital marketing and product innovation on the competitiveness and sustainability of MSMEs in Sukabumi City in facing the challenges of the VUCA (Volatility, Uncertainty, Complexity, Ambiguity) era. The research method used a mixed method, where a quantitative approach with Structural Equation Modeling-Partial Least Square (SEM-PLS) analysis techniques was reinforced by qualitative interviews to explore the practical perspectives of business actors. The results show that digital marketing plays an important role in expanding market reach, enhancing brand image, and building consumer loyalty as the foundation for business sustainability. Product innovation has also been proven to be significant in creating differentiation, maintaining relevance to dynamic market needs, and increasing added value for consumers. However, competitiveness does not function as a significant mediating variable between digital marketing and product innovation on business sustainability. These findings contribute theoretically by enriching the literature on the dynamic capabilities of MSMEs, while challenging the traditional view that competitiveness is the only major factor in business sustainability. Practically, the results emphasize the importance of consistent innovation, the use of digital technology, and the support of an integrated business ecosystem in maintaining the sustainability of MSMEs amid the uncertainty of the VUCA era.

Keywords: *Digital Marketing, Product Innovation, Competitiveness, Sustainability.*



A. INTRODUCTION

The VUCA era (Volatility, Uncertainty, Complexity, Ambiguity) has increasingly shaped the dynamics of the global business environment, including the Micro, Small, and Medium Enterprise (MSME) sector. Originally a military concept in the 1980s, VUCA now describes today's volatile market changes, unpredictable crises, and complex interactions between economic and technological forces. For Indonesia, this context is particularly critical since MSMEs contribute over 60% of GDP and employ more than 97% of the national workforce (Ministry of Cooperatives and MSMEs, 2023). Despite their strategic role, MSMEs face persistent structural challenges such as limited capital, low digital literacy, and restricted access to advanced technology (Yanto et al., 2022) which are magnified by the disruptive pace of the VUCA era.

Digital transformation has emerged as an essential survival and growth strategy for MSMEs in this environment. By embedding digital technology in marketing, e-commerce, payment systems, data analytics, and supply chain management, MSMEs can strengthen competitiveness and resilience. Empirical evidence Bening et al.(2023) demonstrates the positive impact of digital adoption on business sustainability.

However, digital transformation is not straightforward. Implementation is often hindered by internal constraints, such as human resource capacity and organizational culture, as well as external barriers, such as weak infrastructure and insufficient government support (Petropoulou et al., 2024).

The main problem lies in MSMEs' low capacity for sustainable digital adaptation. Many remain at the early stages of digitization and struggle to strategically integrate technology into business models (Díaz-Arancibia et al., 2024). Digital initiatives are often reactively adopted temporarily during crises like COVID-19 without long-term planning for sustainability. Moreover, limited understanding of dynamic capabilities and weak uncertainty management impede MSMEs' ability to adapt to evolving consumer preferences and intensifying competition. While literature affirms the benefits of digital transformation, most studies isolate technological, resource, business model, or ecosystem factors instead of presenting an integrated strategic framework relevant to the VUCA environment (Hojnik and Huđek, 2023).

This creates a significant research gap. Theoretically, previous research has examined digitalization in general or in crisis-specific contexts (e.g., COVID-19) but has not comprehensively analyzed MSME digital adaptation under the holistic VUCA framework (Chi et al., 2023). Empirically, Indonesian studies tend to measure adoption levels (e.g., e-commerce usage) without exploring strategic adaptation processes or the development of dynamic capabilities needed for sustainable transformation (Mohamed Salleh, 2021). Practically, recommendations from prior research often remain generic and fail to address the integrated role of technology, resources, business model innovation, and ecosystem collaboration in enabling resilience within the VUCA context. Given these gaps, there is an urgent need to develop a digital adaptation strategy tailored to Indonesian MSMEs operating under VUCA conditions. The novelty of this research lies in proposing a comprehensive framework that goes beyond technology adoption. It integrates dynamic capability theory, resource-based view, and institutional perspectives to emphasize how MSMEs can build resilience through technological adoption, innovation in business models, and collaborative ecosystems.

Theoretically, this study will enrich MSME digital adaptation literature by explicitly linking it to the VUCA paradigm. Practically, it offers strategic guidance for MSME actors, policymakers, and supporting institutions to design interventions and capacity-building programs that are sustainable and digitally grounded. By advancing a holistic framework, the study contributes to bridging the gap between theory and practice, ensuring that MSMEs not only survive but thrive in the disruptive realities of the VUCA era

B. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

1. Digital Marketing

Digital marketing is a marketing strategy that utilizes digital technology and the internet to create, communicate, and deliver value to consumers, while building long-term relationships with customers (Setiadi et al., 2025). This strategy encompasses various channels such as social media, *search engine marketing*, email marketing, content-

based marketing, and e-commerce. In the context of SMEs, digital marketing provides opportunities to reach a wider market at a relatively low cost compared to traditional marketing, while also providing analytical data that can be used for decision-making (Sharabati et al., 2024). Furthermore, the adoption of digital marketing can enhance the competitiveness of SMEs by strengthening their brands, increasing sales, and facilitating customer interactions. Research (Robu and Lazar, 2021) confirms that digital marketing also enables SMEs to respond quickly to market changes, which is crucial in the VUCA era. Digital infrastructure support and technological literacy are key factors in the success of this strategy.

2. Product Innovation

Product innovation involves developing, improving, or creating products that deliver added value to customers and strengthen competitive advantage (Mohamed Salleh, 2021). For MSMEs, it includes not only new product discovery but also enhancements in features, design, quality, and packaging to meet market demands (Chen et al., 2020). From a Resource-Based View perspective, innovation is a strategic resource for differentiation and competitiveness. In the VUCA era, innovation enables MSMEs to adapt swiftly to shifting consumer preferences and dynamic competition. Empirical studies show that product innovation enhances marketing performance, expands market share and, when integrated with digital technology, accelerates product development and quality improvement. Moreover, ecosystem support through supplier collaboration and strategic partnerships further strengthens the success of innovation.

3. Competitiveness

Competitiveness refers to an organization's ability to maintain and strengthen its market position by creating superior value for customers compared to competitors (Wahyuni et al., 2020). According to the Resource-Based View (RBV), sustainable competitiveness arises from resources that are valuable, rare, inimitable, and non-substitutable. For MSMEs, competitiveness is shaped by product quality, pricing, service, innovation, and effective marketing strategies. In the VUCA era, adaptability and flexibility are also critical. Empirical evidence highlights that innovation and digitalization significantly enhance MSME competitiveness, while human resource development and technology adoption serve as key enablers (De et al., 2024). Ultimately, strong competitiveness not only improves profitability but also ensures long-term sustainability.

4. Business Sustainability

Business sustainability is an organization's ability to maintain long-term performance by considering economic, social, and environmental dimensions (Nica et al., 2025). In the context of MSMEs, business sustainability means being able to adapt to market changes, maintain profitability, fulfill social responsibilities, and minimize environmental impact. The Triple Bottom Line Framework emphasizes that

sustainability is not only measured by financial profits, but also by social contributions and ecological sustainability (Nica et al., 2025). Research Wang et al. (2024) that innovation, collaboration, and strong competitiveness directly contribute to the sustainability of MSMEs. In the VUCA era, sustainability requires adaptive technology-based strategies and cross-sector collaboration to reduce risks and take advantage of new opportunities.

5. Digital Marketing on the Competitiveness of MSMEs

Digital marketing provides opportunities for MSMEs to increase competitiveness through market reach expansion, cost efficiency, and personalized customer service. In the VUCA era, digital marketing helps SMEs respond quickly and accurately to changes in consumer demand (Sharabati et al., 2024). Research Minh Sang (2023) shows that digital-based marketing strategies significantly contribute to improving brand image and customer loyalty. Additionally, Bhatti et al. (2022) emphasizes that digital marketing technology enables SMEs to utilize big data for more accurate market segmentation. Sharabati et al. (2024) also prove that the adoption of digital marketing enhances a company's competitive ability in a dynamic market. Thus, the higher the implementation of digital marketing, the stronger the competitiveness of SMEs.

H1: Digital Marketing has a positive effect on the competitiveness of MSMEs

6. Product Innovation on the Competitiveness of MSMEs

Product innovation enables SMEs to differentiate themselves from competitors through unique and valuable offerings to consumers (Hang et al., 2022). The Resource-Based View theory positions innovation as a strategic resource that can enhance competitiveness. Research Ahmed et al. (2024) found that product innovation contributes to increased customer satisfaction and market share expansion. Sufyan et al. (2024) emphasize that innovation, whether radical or incremental, strengthens competitive position in rapidly changing markets. Shows that collaborative product innovation accelerates adaptation to change. Permana et al. (2023) add that innovation is key to the competitiveness of MSMEs in the digital era. The higher the product innovation, the greater the potential for increasing the competitiveness of MSMEs.

H2: Product Innovation has a positive effect on the Competitiveness of MSMEs

7. Digital Marketing on the Sustainability of MSME Business

Digital marketing is a technology-based marketing strategy that enables MSMEs to expand their market reach, increase customer interaction, and optimize sales at a relatively efficient cost. In the VUCA era, digital marketing helps MSMEs respond quickly to changes in consumer trends, thereby maintaining the relevance of their products and services (Zhang et al., 2025). Research Suharto et al. (2022) found that the use of social media, e-commerce, and data-driven marketing can increase customer loyalty and strengthen market position. Magableh et al. (2024) emphasize that data-

driven marketing facilitates strategic decision-making that supports long-term sustainability.

H3: Digital Marketing Positively Influences the Sustainability of SME Businesses

8. Product Innovation on the Sustainability of SME Businesses

Product innovation provides added value that differentiates MSMEs from competitors, increases customer satisfaction, and expands market share (Mohamed Salleh, 2021). According to the Resource-Based View, innovation is a strategic resource that is difficult to imitate, so it can be the basis for sustainability. Kraetzig et al. (2024) found that consistent innovation improves a company's competitiveness and sustainability. Research by Alonso-Ubieta et al.(2020) shows that product innovation that is adaptive to market needs can maintain business continuity amid uncertainty. Biemans(2023) emphasizes that sustainable innovation is an important prerequisite for long-term growth. Marshall et al.(2020) adds that innovation combined with strategic partnerships strengthens sustainability. Therefore, the higher the level of product innovation carried out by MSMEs, the greater their ability to maintain business sustainability.

H4: Product Innovation has a positive effect on the Sustainability of MSME Business

9. Competitiveness on the Sustainability of MSME Business

High competitiveness ensures the survival of MSMEs in competitive markets, even amid VUCA(Wahyuni et al., 2020). Mackey & Mackey (2023) found that companies with sustainable competitive advantages are better able to maintain long-term performance. Maulana Prasetya et al.(2024) emphasize that competitiveness must be supported by dynamic capabilities in order to adapt business strategies to environmental changes. The study Raza et al. (2024) also proves that innovation-based competitiveness enhances sustainability. Competitiveness is an important mediator in the relationship between innovation and sustainability. Thus, increasing competitiveness will strengthen the sustainability of MSME businesses.

H5: Competitiveness has a positive effect on the sustainability of SME businesses

10. Digital Marketing and Product Innovation on Business Sustainability through Competitiveness

Digital marketing and product innovation are two strategic levers that enhance MSME performance in the VUCA era. Digital marketing expands market reach, fosters customer interaction, and leverages data analytics for informed decision-making, thereby strengthening competitiveness. Product innovation, on the other hand, creates differentiation, boosts customer satisfaction, and ensures business relevance amid dynamic consumer preferences (Chen et al., 2020). From the Resource-Based View (RBV) perspective, sustainable competitive advantage arises from resources that are valuable, rare, and difficult to imitate achievable through digitalization and innovation. Competitiveness, therefore, acts as a mediating mechanism linking digital marketing and product innovation to business sustainability.

H6: Digital Marketing has a positive effect on Business Sustainability through Competitiveness.

H7: Product Innovation has a positive effect on Business Sustainability through Competitiveness.

Based on the development of the above hypotheses, the research framework is described as follows:

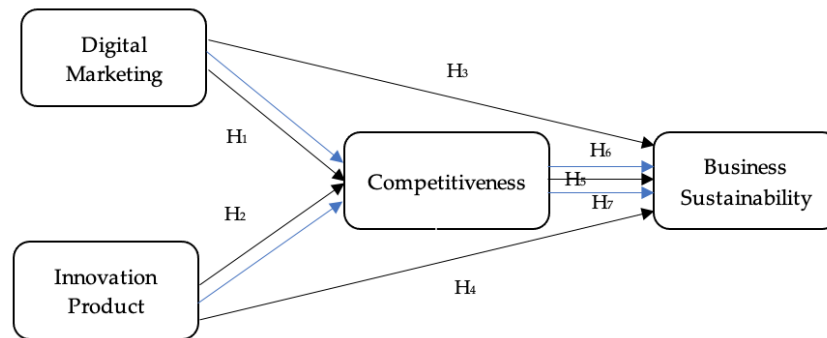


Figure 1. Research Framework

C. METHOD

This study uses a sequential explanatory mixed-methods approach. Quantitative data (to test the relationship between variables and test hypotheses) and qualitative data (to enrich understanding of mechanisms, contexts, and explain quantitative findings) are collected simultaneously. Quantitative and qualitative results are analyzed separately and then integrated at the interpretation stage to obtain comprehensive conclusions. The population in this study was the food industry in Sukabumi City, which numbered 861 (opendata.sukabumikota.go.id). The sample was taken using non-probability purposive sampling, with criteria of a minimum business capital of IDR 15,000,000, a minimum business age of 5 years, and the position of the business owner, resulting in a sample of 100 business actors. To obtain quantitative data, 80 business owners were selected as respondents, and to achieve data depth, 20 business owners became informants in this study.

In this study, there are 5 variables, including 2 independent variables (Digital Marketing and Product Innovation), 1 dependent variable (Business Sustainability), and 1 mediating variable (Competitiveness). Quantitative data was collected through the distribution of questionnaires (Google Form) based on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). Qualitative data was collected through in-depth interviews with 20 selected informants. This study used a mixed-methods approach with a convergent parallel design, integrating quantitative and qualitative data simultaneously. Quantitative data were collected from 80 respondents through questionnaires and analyzed with Partial Least Squares Structural Equation Modelling (PLS-SEM) using SmartPLS 4.0. Instrument quality was tested through validity and reliability analysis, while model evaluation applied path coefficients, R², and bootstrapping with 5,000 resamples at p < 0.05 to assess direct and indirect effects.

Qualitative data were obtained from 20 informants using semi-structured interviews and analyzed through thematic analysis, including open, axial, and selective coding. Credibility was ensured through triangulation and member checking. Results from both strands were integrated with joint displays, providing convergence and divergence insights to deliver a more comprehensive understanding of MSME sustainability

D. RESULTS AND DISCUSSION

1. Testing with the Measurement Model (Outer Model)

In the realm of analysis, the measurement model (outer model) serves to assess the level of validity and reliability of a research model. The outer model also plays a role in explaining the relationship between each indicator and the latent variable it represents. In other words, the measurement model is used to test the suitability of instruments through validity and reliability testing. In this study, the measurement methods used were:

a. Validity Test

The validity test in this study was conducted using two measurement methods, namely convergent validity and discriminant validity. Convergent validity is a key criterion in SmartPLS analysis using reflective indicators. It is assessed through factor loadings, which measure the correlation between item scores and the overall construct, reflecting how well indicators represent the construct. Factor loadings above 0.70 are considered strong for confirmatory studies, while values above 0.60 remain acceptable in exploratory research. This study adopted a minimum threshold of 0.70. Convergent validity is also evaluated using the Average Variance Extracted (AVE), where values exceeding 0.50 indicate sufficient construct representation.

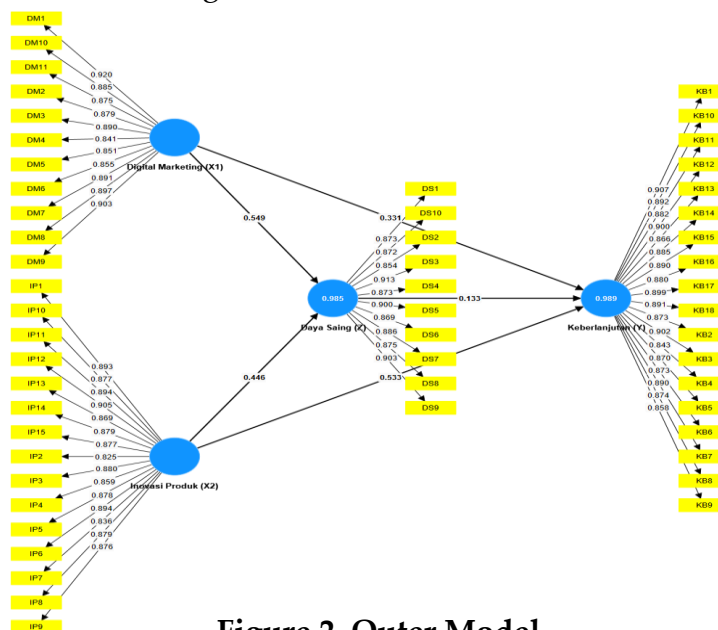


Figure 2. Outer Model

Source: processed using SMART PLS4 (2025)

Figure 2 shows the convergent validity obtained through data processing using PLS software. The evaluation was carried out by looking at the loading factor value

for each construct indicator. A construct is declared to meet convergent validity if the loading factor is greater than 0.70 and the AVE value exceeds 0.5. Information about the results of the Loading Factor on each manifest variable shows that all indicators for the latent variable have a value greater than 0.70, so these indicators are considered valid.

Table 1. AVE Values

Variable	AVE Values
Digital Marketing	0.776
Product Innovation	0.766
Competitiveness	0.778
Business Sustainability	0.778

Source: Data processed by the researcher (2025)

Table 1 demonstrates that all research variables achieved Average Variance Extracted (AVE) values above 0.5, confirming convergent validity. This indicates that the indicators adequately represent their respective latent constructs and possess sufficient explanatory power. Accordingly, the manifest variables are reliable reflections of the constructs, providing a robust foundation for further analysis and ensuring that hypothesis testing is based on valid and trustworthy measurement results.

Discriminant validity was evaluated using Cross Loading Factors and AVE comparisons with latent variable correlations. Results show indicators correlate more strongly with their intended constructs than with others, confirming validity. Thus, all indicators meet the required criteria, accurately measuring their respective latent constructs in this study.

b. Reliability Test

Composite Reliability (CR) and Cronbach's Alpha (CA) are two methods that can be used to measure the reliability of Partial Least Square (PLS):

Table 2. CA and CR

Variable	CA	CR	Conclusion
Digital Marketing	0.971	0.971	Reliable
Product Innovation	0.978	0.978	Reliable
Competitiveness	0.968	0.969	Reliable
Business Sustainability	0.983	0.983	Reliable

Source: Data Processed by the Researcher (2025)

The results indicate that the data is reliable, as all indicators consistently measure each variable, shown by Composite Reliability values above 0.7 and Cronbach's Alpha above 0.6. Structural Model testing assessed relationships among latent variables through path coefficients, with significance determined using the bootstrapping technique. Figure illustrates the bootstrapping results obtained.

Figure 3 illustrates the path coefficient values determined through t-statistics, where results are significant if they exceed 1.96 in a two-tailed test. The analysis shows that the relationship between X1 and Z is significant ($t = 5.897$), and X2 also contributes

strongly to Z ($t = 4.795$). Similarly, X1 influences Y significantly ($t = 3.141$), as does X2 with Y ($t = 4.820$). However, the relationship between Z and Y records a t -value of 1.202, below the 1.96 threshold, indicating that while Competitiveness positively affects Business Sustainability, the effect is not statistically significant, and thus the hypothesis is rejected.

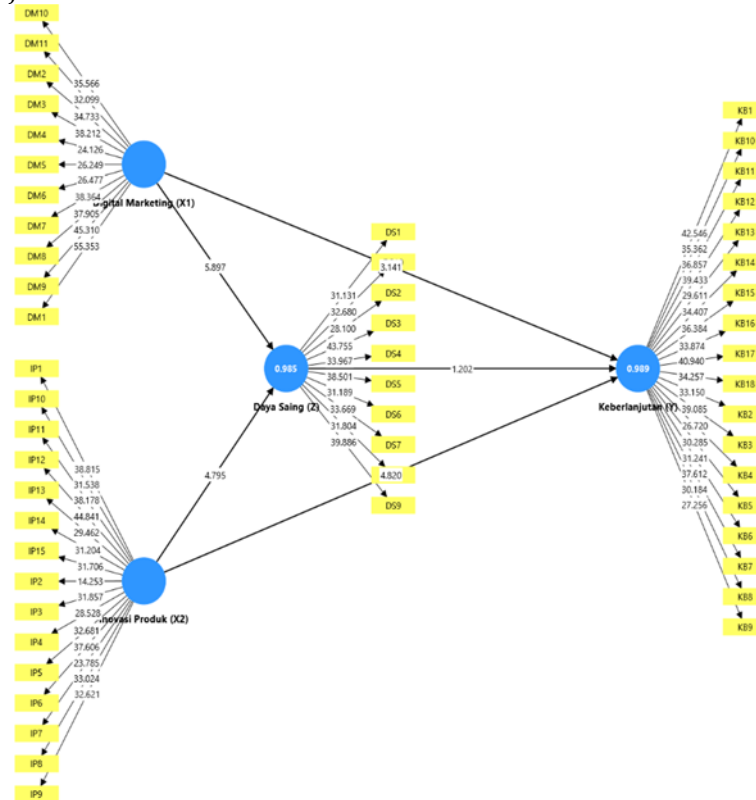


Figure 3. Bootstrapping

Source: Processed by Smart PLS 4(2025)

Structural model (inner model) testing with SMARTPLS 4 further evaluated relationships between latent constructs using R-square values, complemented by t -tests and path significance analysis to validate the model.

Table 3. R Square Results

Variable	R-square	Adjusted R-square
Competitiveness	0.985	0.985
Business Sustainability	0.989	0.988

Source: Data Processed by the Researcher (2025)

The R-square analysis shows Competitiveness has a value of 0.985, indicating that Digital Marketing and Product Innovation explain 98.5% of its variance. Business Sustainability records an R-square of 0.989, meaning these variables account for 98.9% of its influence. These high values demonstrate the model’s strong predictive power, confirming that the studied variables significantly shape sustainability, with minimal influence from external factors.

2. Hypothesis Testing

Hypothesis testing was conducted after the data met the measurement criteria using the bootstrapping method in Smart PLS4. This technique does not require the assumption of normal distribution or a large sample size. The testing was conducted through an analysis of path coefficient values, t-values, and p-values to assess the influence between variables, as well as parameter coefficients that indicate the level of significance of each variable.

Table 4. Path Significance Test

Relationship	Original Sample (O)	T statistics (O/STDEV)	P values
Digital Marketing (X1) → Business Sustainability (Y)	0.331	3.141	0.002
Digital Marketing (X1) → Competitiveness (Z)	0.549	5.897	0.000
Product Innovation (X2) → Business Sustainability (Y)	0.533	4.820	0.000
Product Innovation (X2) → Competitiveness (Z)	0.446	4.795	0.000
Competitiveness (Z) → Business Sustainability (Y)	0.133	1.202	0.230
Digital Marketing → Competitiveness → Business Sustainability	0.073	1.167	0.243
Product Innovation → Competitiveness → Business Sustainability	0.059	1.129	0.259

Source: Data Processed by the Researcher (2025)

This study analyzed the relationships among digital marketing, product innovation, competitiveness, and business sustainability of MSMEs in Sukabumi using a mixed-methods approach. The results of the quantitative tests through PLS-SEM were complemented with qualitative evidence from interviews and FGDs, offering a comprehensive view of how these variables interact.

The quantitative analysis confirmed that digital marketing has a significant positive effect on competitiveness, with a t-value of 5.897 (>1.96), p-value of 0.000 (<0.05), and an original sample estimate of 0.549. This indicates that improvements in digital marketing strategies increase MSME competitiveness by 54.9%. Qualitative insights reinforce these findings. Informants highlighted that social media and marketplace platforms have enabled MSMEs to expand their reach beyond local markets to a broader national level. Practical examples included the use of short videos, customer reviews, and educational content. Informants shared cases of turnover doubling through creative digital campaigns, while others noted the effectiveness of “behind the scenes” storytelling in building trust and brand loyalty. The FGD results unanimously recognized digital marketing as the most effective tool for promotion, trust-building, and market expansion. These results align with existing literature emphasizing the role of digital strategies in building brand equity and competitive advantage (Minh Sang, 2023).

Product innovation was also shown to significantly enhance competitiveness, with a t-value of 4.795, p-value of 0.000, and an original sample estimate of 0.446. This suggests that stronger product innovation increases competitiveness by 44.6%. The qualitative data supported this conclusion. Informants emphasized the importance of innovating in product design, flavors, packaging, and production processes to remain

relevant in a dynamic market. Examples included flavor diversification, healthier product variations, and modernization of traditional goods to attract younger consumers. Informants also highlighted environmentally friendly packaging and production efficiency improvements as strategies that increase competitiveness. The FGDs confirmed innovation as a key differentiating factor in saturated markets. These findings align with prior research that underscores innovation's role in creating differentiation, consumer loyalty, and long-term competitiveness (Rashidirad and Salimian, 2020).

Digital marketing was found to have a significant positive effect on business sustainability, with a t-value of 3.141, p-value of 0.002, and an original sample coefficient of 0.331. This indicates that enhanced digital marketing increases sustainability by 33.1%. From the interviews, MSME players emphasized that digital marketing is not only a promotional tool but also a strategic foundation for long-term continuity. By building consumer trust, strengthening brand image, and ensuring consistent demand, digital strategies provide resilience against fluctuating local markets. Examples included educational content and customer reviews as key drivers of consumer loyalty. The FGDs confirmed that digital marketing supports sustainability by increasing efficiency, strengthening retention, and connecting MSMEs with broader communities. These findings are consistent with studies that highlight the long-term value of digital marketing in sustainability-based competitiveness (Dallocchio et al., 2024).

Product innovation showed a significant positive influence on business sustainability, with a t-value of 4.820, p-value of 0.000, and a path coefficient of 0.533. This means that increased innovation contributes to sustainability by 53.3%. Qualitative evidence revealed that MSMEs view innovation as essential for survival. Examples included flavor diversification, environmentally friendly designs, healthier products, and modernized packaging. Informants stressed that innovation not only meets changing consumer demands but also supports loyalty, efficiency, and adaptability. FGDs reinforced that sustainable growth requires innovation in both product and packaging, particularly those aligned with health and environmental trends. Literature supports this, emphasizing innovation as a foundation for sustainability through differentiation, resource efficiency, and alignment with consumer values (Chen et al., 2020).

Interestingly, competitiveness did not have a significant effect on business sustainability, as shown by a t-value of 1.202 (<1.96), p-value of 0.230 (>0.05), and a path coefficient of 0.133. This suggests that while competitiveness has a positive tendency, it is not sufficient to guarantee sustainability. Interviews revealed that although MSMEs pursued competitiveness through product quality, pricing, and promotions, sustainability was more dependent on innovation, digital marketing, and adaptability to consumer trends. Informants noted that high competitiveness in design or pricing did not ensure continuity without capital, digital skills, or loyal customers. FGDs confirmed that sustainability requires more than competitiveness alone, emphasizing innovation, digital interaction, and regulatory support. These

findings are consistent with research showing that sustainability depends more on adaptation and innovation than on traditional competitive advantages (El Chaarani et al., 2021).

The mediating effect of competitiveness between digital marketing and sustainability was not significant, with a t-value of 1.167 (<1.96), p-value of 0.243 (>0.05), and a coefficient of 0.073. Although the relationship is positive, competitiveness did not significantly mediate this path. Qualitative findings clarified that while digital marketing increases exposure and market competitiveness, sustainability relies on additional factors such as innovation, consumer loyalty, and ecosystem support. Informants emphasized that even when digital marketing improved brand image, sustainability was constrained by limited capital or regulations. Others stressed that long-term survival depended more on innovation and customer loyalty than digital competitiveness. FGDs agreed that sustainability requires comprehensive strategies beyond competitiveness, integrating innovation, regulation, and consumer engagement.

The mediating effect of competitiveness between product innovation and sustainability was also not significant, with a t-value of 1.129 (<1.96), p-value of 0.259 (>0.05), and a coefficient of 0.059. While innovation enhances competitiveness, this does not directly translate into sustainability through competitiveness. Qualitative evidence highlighted that sustainability depends more on consistent innovation, customer loyalty, and adaptability than on temporary competitive advantages. Informants mentioned that even innovative products faced constraints from bureaucracy, capital, or unstable demand. FGDs emphasized that sustainability requires holistic strategies, combining innovation with digital marketing and ecosystem support.

Based on the statistical results and interviews conducted, the following conclusions can be drawn, as outlined in the table below:

Table 5. Summary of Research Results

Variable Relationships	Findings	Explanation
Digital Marketing → Competitiveness	Significant (+)	Enhances competitiveness through market expansion, brand image strengthening, and customer trust.
Digital Marketing → Sustainability	Significant (+)	Strengthening sustainability through customer loyalty, sales stability, and long-term relationships.
Digital Marketing → Competitiveness → Sustainability	Not Significant	Competitiveness mediation is insufficient to support sustainability, where sustainability is more determined by innovation, loyalty, and adaptation to trends.
Product Innovation → Competitiveness	Significant (+)	Drives product differentiation, production efficiency, and relevance to market trends.
Product Innovation → Sustainability	Significant (+)	Maintains consumer demand and product relevance in the long term.

Product Innovation → Competitiveness → Sustainability	Not Significant	Mediating competitiveness does not make innovation significantly impactful; sustainability requires ecosystem support.
Competitiveness → Sustainability	Not Significant	Competitiveness alone does not guarantee sustainability without innovation, digital adaptation, and supportive regulations.

This study examines the influence of digital marketing, product innovation, and competitiveness on the sustainability of MSMEs in Sukabumi City. The findings provide comprehensive insights into both direct and indirect effects, highlighting key factors that support MSME adaptation in an increasingly dynamic business environment.

First, the research establishes that digital marketing significantly enhances competitiveness. By strengthening visibility, brand awareness, and consumer engagement, digital marketing provides MSMEs with real contributions to their competitive position. The ability to reach wider audiences, personalize marketing strategies, and streamline promotional communication makes digital marketing a vital tool in the digital economy. For MSMEs, these findings emphasize the need to consistently integrate digital marketing into their core strategies, supported by investments in human resource development, digital infrastructure, and creative content. In addition, the practical implications of these findings are the need to increase human resource capacity, digital infrastructure, and content creativity so that digital marketing can have a more optimal impact on increasing competitiveness and is in line with previous studies conducted (Muis, Kamalia and Adhi, 2024).

Second, the study confirms that product innovation is a crucial determinant of competitiveness. Innovative products foster differentiation, added value, and market relevance, all of which are essential for sustaining competitive advantage. Consistent with Porter's theory of competitive advantage, product differentiation enables MSMEs to withstand competitive pressures. The study suggests that MSMEs must continually update product design, quality, and features to remain attractive to consumers. Prior research further supports this, demonstrating that innovation strengthens competitiveness through improvements in quality, efficiency, sustainability, and customer experience. The results of this study are in line with previous studies conducted by (Ma, 2024) that product innovation can strengthen competitiveness by combining improvements in quality, cost and process efficiency, sustainability, and enhanced user experience.

Third, the study finds that digital marketing directly impacts business sustainability. By expanding market reach, facilitating customer interaction, and reducing promotional costs, digital marketing becomes more than a promotional tool; it acts as an adaptive strategy for long-term viability in the digital era. MSMEs that embrace digital transformation and continuously innovate in online marketing are better positioned to maintain sustainability in competitive markets. This finding aligns with earlier studies highlighting the role of digital tools in improving marketing strategies and securing long-term success. The results of this study are in line with previous research conducted by (Maulana and Suyono, 2023) that by understanding

how to use digital tools effectively, MSME entrepreneurs can improve their marketing strategies, which in turn increases the chances of business sustainability.

Fourth, the results demonstrate that product innovation also directly contributes to business sustainability. Innovation allows MSMEs to adapt to evolving consumer needs, strengthen customer satisfaction, and secure long-term competitiveness. It plays a central role in expanding market share and ensuring firms remain relevant amidst environmental changes. Previous research supports this conclusion, emphasizing that innovation drives sustainable advantage through operational efficiency, performance improvements, and enhanced consumer value. This is in line with research conducted by (Kurniawati et al., 2022), which found that innovation not only increases competitive advantage but also serves as the key to the sustainability of MSME businesses by improving performance and operational efficiency.

Interestingly, the study reveals that competitiveness alone does not significantly influence business sustainability. While competitiveness is often viewed as a determinant of long-term viability, in this context it was not a dominant factor. The findings suggest that sustainability may depend more on other variables such as innovation, digitalization, management quality, and supportive external policies. Although competitiveness contributes positively, its role is complementary rather than decisive. Without the reinforcement of innovation and digital strategies, competitiveness alone does not provide sufficient leverage for long-term business sustainability. Competitiveness remains important, but it is not enough if it is not balanced with other more strategic aspects of business management. These findings are supported by research conducted by (Carlsson and Nevzorova, 2024).

The study also investigates mediating effects. It finds that competitiveness does not significantly mediate the relationship between digital marketing and business sustainability. While digital marketing directly influences sustainability, its indirect effect through competitiveness is weak. One possible explanation is the homogeneity of digital strategies among MSMEs, which makes it difficult to gain unique competitive advantages. Additionally, high levels of digital competition and underutilization of digital tools may limit the ability of competitiveness to strengthen sustainability outcomes. This highlights the need for MSMEs to integrate digital marketing with differentiation and innovation in order to generate stronger competitive positions.

The results show that competitiveness does not significantly mediate the effect of product innovation on business sustainability. Although the relationship is positive, its impact is minimal, indicating that innovation alone does not ensure sustainability through competitiveness unless supported by broader strategies. MSMEs must complement innovation with cost efficiency, digital transformation, and service quality to maximize competitiveness. Theoretically, this challenges the Resource-Based View (RBV), highlighting that in the VUCA era, sustainability is better explained by dynamic capabilities digital marketing, innovation, and institutional support integrating Dynamic Capabilities, RBV, and Institutional

Theory. Practically, MSMEs should prioritize strengthening digital marketing, consistently pursuing innovation in design, packaging, and features, and leveraging government and institutional support for digital ecosystems, financing access, literacy training, and continuous mentoring to build long-term resilience.

E. CONCLUSION

This study demonstrates that digital marketing and product innovation significantly influence MSME competitiveness and business sustainability in Sukabumi City, both directly and as adaptation strategies. Digital marketing contributes to market expansion, brand strengthening, and consumer loyalty, while product innovation supports differentiation, market relevance, and operational efficiency. Together, these factors are essential for MSMEs to address VUCA challenges. However, competitiveness was not significant as a mediating factor, suggesting that sustainability depends more on innovation, digitalization, and ecosystem support than on traditional competitive advantage. Theoretically, this research integrates Dynamic Capabilities, Resource-Based View (RBV), and Institutional Theory, emphasizing dynamic capabilities particularly digital marketing and innovation as central to MSME resilience in VUCA environments. The findings challenge RBV's conventional emphasis on competitiveness, highlighting innovation, digitization, and institutional support instead. Practically, MSMEs should prioritize digital marketing and product innovation, while policymakers must strengthen digital ecosystems through financing access, training, and mentoring. Limitations include the focus on food MSMEs in Sukabumi; broader sectoral and regional studies, additional variables, and longitudinal approaches are recommended to capture sustainability impacts more comprehensively.

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