

The Impact of Digital Technology and Product Innovation on the Competitiveness of MSMEs in the Digital Economy Era

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Abstract-This study examines the influence of digital technology and product innovation on the competitiveness of micro, small, and medium enterprises (MSMEs) in the current digital economy era. A quantitative research method was applied using a Likert-scale questionnaire distributed to local business owners. The digital technology variable (X1) was measured through two dimensions: perceived ease of use, which describes how easily business owners can operate digital tools, and attitude toward use, which reflects their positive feelings and satisfaction when interacting with technology. The product innovation variable (X2) focused on technical innovation related to product development. Competitiveness (Y) was assessed through three main dimensions: competitive pricing, which includes affordability and value; product quality, which covers durability and visual appeal; and consumer loyalty, reflected in repeat purchases and customer recommendations. All questionnaire items were developed based on a structured theoretical framework to ensure measurement accuracy. Respondents were selected using purposive sampling to capture real competitiveness conditions among MSMEs in the surrounding area. The findings reveal that neither digital technology (X1) nor product innovation (X2) shows a statistically significant influence on MSME competitiveness (Y). With an R-square value of 19.2%, the study indicates that these two variables are not yet the main determinants of competitiveness in the sampled MSMEs. The remaining 80.8% of competitiveness variation is explained by other factors outside the research model.

Keywords: Digital Technology; Product Innovation; Competitiveness; Market; UMKM

1. INTRODUCTION

The development of digital technology in the digital economy era has brought significant and transformative changes to various sectors, including Micro, Small, and Medium Enterprises (MSMEs). (Lutfi et al., 2020) The rapid emergence of digital platforms, automation tools, and online-based business services has reshaped how MSMEs operate, compete, and interact with customers. The use of digital technology is no longer merely an alternative choice, but has become a fundamental necessity for MSMEs to improve operational efficiency, expand market reach, and create sustainable competitive advantages. (Prayoga et al., 2025) Digital tools such as e-commerce platforms, bookkeeping applications, digital payment systems, and social media marketing allow MSME actors to manage their businesses more effectively and reach a broader consumer base. The availability of digital technology enables MSME players to optimize various business functions, starting from production processes, product distribution, marketing, and even customer service. Sofian Lusa,dkk (2024). Ease of use as reflected in how simple and accessible these digital tools are is a crucial factor that determines how quickly MSMEs can adopt and utilize digital systems. Likewise, the attitude toward technology, which reflects the positive feelings, confidence, and satisfaction of MSME actors when using digital tools, also plays an essential role in ensuring successful digital adoption. When business actors feel comfortable and confident using technology, they are more likely to integrate it consistently into their business operations. (Ayuningtyas et al., 2024).

However, despite the potential advantages, many MSMEs are still unable to fully utilize digital technology. Several barriers continue to emerge, such as limited digital literacy, lack of access to supporting infrastructure, and financial constraints to adopt more advanced technology. These limitations often result in low levels of competitiveness, especially when MSMEs must compete in markets that are increasingly dynamic and saturated with digital-based competitors. (Resna Napitu, S.E., M.Si, 2025) The gap between technology availability and the ability of MSMEs to adopt it effectively continues to widen, creating challenges that must be addressed through continuous capacity building, training programs, and strategic government support. Alongside digital technology, product innovation also holds an important role in enhancing MSME competitiveness. Product innovation particularly technical innovations that improve functionality, appearance, durability, and value enables MSMEs to offer products that better respond to consumer needs and market trends. Innovative products not only meet basic quality standards but also create differentiation that can strengthen brand identity. Visual appeal, modern design, improved durability, and functional superiority are aspects that increasingly influence consumer purchasing decisions. (Surajiyo et al., 2025) Thus, product innovation becomes a critical strategy to maintain customer loyalty, attract new market segments, and win competition in industries that demand continuous creativity. Competitiveness among MSMEs can be assessed through several indicators, including the ability to offer competitive and affordable prices, ensure consistent product quality, and maintain strong consumer loyalty. The integration of digital technology and product innovation is believed to strengthen the market position of MSMEs. Digital technology supports efficiency and business visibility, while innovation helps MSMEs offer unique value that competitors may not have. In the digital era, where effectiveness, adaptability, and creativity are vital, the combination of both factors becomes essential for sustaining long-term business success. Therefore, this study was conducted to analyze the extent to which digital technology and product innovation influence the competitiveness of MSMEs, particularly among local

business actors who represent the focus of this research. The research emphasizes how technological readiness, user attitudes, and innovation capacity contribute to shaping competitive strength in a rapidly evolving digital market environment.

This study aims to analyze the impact of digital technology and product innovation on MSME competitiveness in the digital economy era. Specifically, it seeks to determine the extent to which the use of digital technology covering operational convenience and the positive attitudes of MSME players toward technological tools can enhance business effectiveness and strengthen competitive advantages. Moreover, the study also examines the role of product innovation, particularly technical innovations that increase product quality, added value, and visual appeal, in influencing consumer loyalty and strengthening MSMEs' market positions. (Sendy Pratama et al., 2024). The findings of this study are expected to provide an empirical basis for MSME actors, policymakers, and related stakeholders in formulating strategies to support business development and competitiveness improvement amid the growing demands of the digital economy.

2. RESEARCH METHODS

2.1 Basic Research Framework

This research method employs a quantitative approach with a descriptive-verification research type, which is designed to measure, analyze, and verify the influence of digital technology and product innovation on the competitiveness of Micro, Small, and Medium Enterprises (MSMEs). A quantitative approach is considered appropriate because it allows researchers to process numerical data, test hypotheses, and identify the strength of relationships between variables objectively. The descriptive aspect aims to provide a detailed picture of the current condition of MSMEs regarding their use of digital technology and product innovation, while the verification aspect seeks to test whether these factors significantly influence MSME competitiveness. To examine these relationships, this study uses multiple regression analysis. Multiple regression is a statistical technique that measures the linear relationship between two or more independent variables and a dependent variable. In this study, the independent variables consist of (X1) Digital Technology and (X2) Product Innovation, while the dependent variable (Y) is MSME Competitiveness. The application of multiple regression enables researchers to determine the magnitude of the influence of each independent variable both individually and simultaneously on the competitiveness of MSMEs. This technique also helps identify whether the observed relationships occur due to statistical significance or random chance.

Digital technology (X1) is operationalized through indicators such as perceived ease of use and attitude toward technology application, which reflect how effectively MSME actors operate digital tools. Product innovation (X2) is measured based on technical improvements in product design, functionality, durability, and visual appeal. Meanwhile, MSME competitiveness (Y) includes aspects such as competitive pricing, product quality, and customer loyalty, all of which are essential indicators for evaluating the sustainability and performance of MSMEs in competitive markets. The research was conducted within a defined geographical area involving MSME actors operating in the region. The population in this study includes all MSMEs that utilize digital technology in their business activities. However, because the population is large and varied, the researchers applied purposive sampling to select respondents who meet specific criteria relevant to the research objectives. Purposive sampling is a non-probability sampling technique that selects participants based on predetermined characteristics and relevance to the study.

The criteria used to determine the sample include MSMEs that have been operating for at least one year, as businesses within this timeframe are assumed to have stable operations and experience in using digital tools. Additionally, the selected MSMEs must utilize digital media such as social media, online marketplaces, or digital payment systems in their marketing or daily business operations. This requirement ensures that respondents have actual experience with digital technology, making their responses valid for evaluating the influence of such technology on competitiveness. Finally, respondents must be willing to voluntarily complete the research questionnaire, ensuring ethical compliance and the reliability of collected data (Suarantalla & Rizqi, 2024). Furthermore, this methodology emphasizes the importance of ensuring data validity and reliability through structured questionnaire design, clear operational definitions, and consistent measurement scales. By adopting these procedures, the study aims to minimize potential biases and strengthen the accuracy of statistical interpretations. The research is also expected to produce findings that help policymakers, MSME owners, and stakeholders understand the extent to which digital adoption and innovation practices contribute to strengthening business competitiveness. In addition, the results of this study may offer valuable insights for developing training programs, digital literacy initiatives, and innovation-supporting policies tailored to the needs of MSMEs. Through this systematic methodology, the study seeks to generate empirical evidence that deepens the understanding of how digital transformation and innovation shape the competitive landscape of MSMEs in today's fast-evolving digital economy.

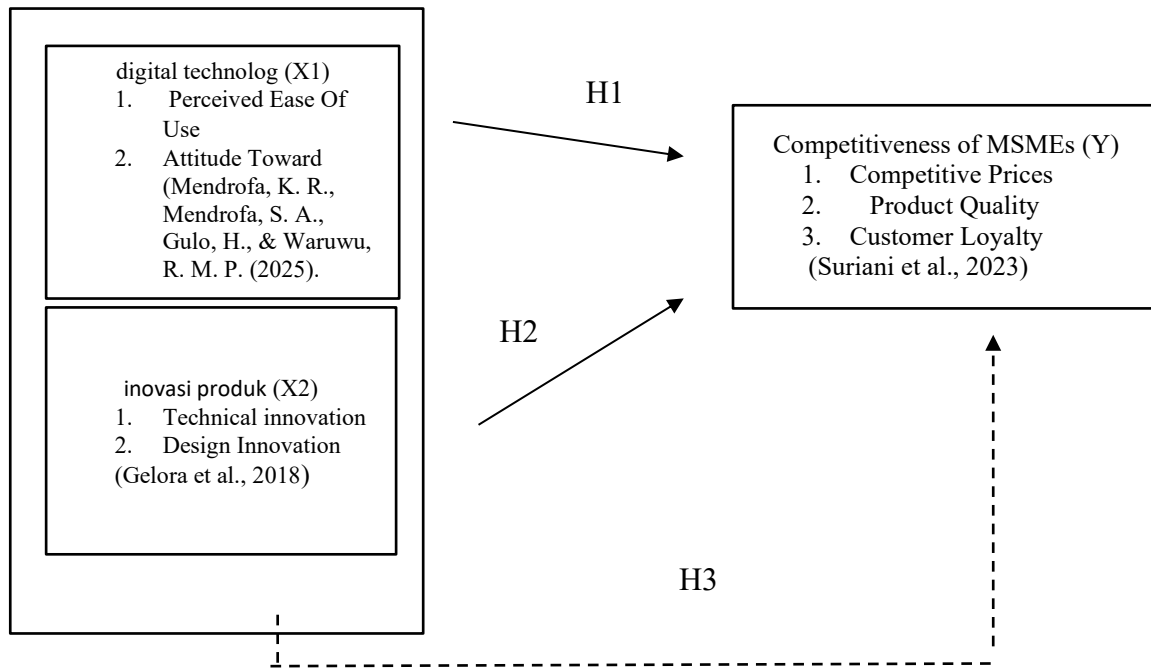


Figure 1. Conceptual framework

H1 The use of digital technology (X₁) has a positive but insignificant effect on the competitiveness of MSMEs.

H2 Product innovation (X₂) has no positive effect on the competitiveness of MSMEs.

H3 The combined use of digital technology and product innovation has a positive impact, but does not affect the competitiveness of MSMEs.

3. RESULT AND DISCUSSION

3.1 Result

Table 1. Descriptive statistics on the use of digital technology (X₁)

indicators	N	Mean	Std.Deviation
Ease of use of technology (X1.1)	31	4.55	0,61
Experience when using technology (X1.2)	31	4.52	0,65
Valid N (based on the list) (X1.3)	31		

Based on Table 1, indicator X1.1, namely “Ease of use of technology,” has the highest mean value of 4.55, which shows that respondents are most positive in assessing the ease of using digital technology. Meanwhile, indicator X1.2, “Experience when using technology,” has the lowest mean of 4.52, making it the lowest-rated aspect compared to other indicators in the digital technology use variable (X₁). (Ayuningtyas et al., 2024). Overall, both indicators still show a very positive perception (still above 4.50), but “ease of use of technology” is the most dominant factor and most appreciated by respondents in the digital technology use variable (X₁).

Table 2. Statistik deskriptif inovasi produk (X₂)

Indicators	N	Mean	Std.Deviation
1. Always updating the menu/products	31	4.48	0.72
2. Improving existing products	31	4.45	0.60
3. Unique packaging	31	4.48	0.69
4. Product design creativity	31	4.42	0.68

Based on Table 2, indicator X2.1, namely “Developing existing products to be better,” has the highest mean value of 4.55, which shows that respondents are most positive in assessing the aspect of continuous product development and improvement in the product innovation variable (X₂). Meanwhile, indicator X2.4, “Product design creativity,” has the lowest mean of 4.42, making it the lowest-rated aspect compared to other indicators in the product innovation variable (X₂). Overall, both indicators still show a very positive perception (still above 4.40), but “ease of developing existing products to be better” is the most dominant factor and most appreciated by respondents in the product innovation variable (X₂). (Surajiyo et al., 2025).

Table 3. Descriptive statistics of MSME competitiveness (Y)

Indicators	N	Mean	Std.Daviation
1. Price matches quality	31	4.42	0.68
2. Affordable price	31	4.29	0.75
3. Product durability	31	4.42	0.75
4. Attractive appearance	31	4.39	0.82
5. Repeat purchases	31	4.42	0.69
6. Recommendations to others	31	4.39	0.68

Based on Table 3, indicator Y.3, namely “Repeat purchase,” has the highest mean value of 4.42, which shows that respondents are most positive in assessing the willingness of customers to make repeat purchases. This reflects a fairly high level of customer loyalty to the MSME products studied. Meanwhile, indicator Y.1, “Affordable price,” has the lowest mean value of 4.29, making it the aspect that is relatively the lowest rated compared to other indicators in the MSME competitiveness variable (Y), although it is still in the very good category. (Sedy Pratama et al., 2024)

Table 4. simultaneous Test Results. (F)

		Anova				
	Model	Sum of Squares	df	Mean square	F	Sig
1	Regression	2.127	5	425	1.125	344
	Residual	8.970	25	359		
	Total	11.097	30			

a. Dependent Variable: SME Competitiveness
 b. Predictors: (Constants), Digital Technology, Product Innovation

Based on Table 4, the results of the Simultaneous Test (F-test) show that the F value is 1.185 with a Sig. (p-value) of 0.344. Because the Sig. value of 0.344 > 0.05, Ho is accepted and Ha is rejected. This means that simultaneously (together), the independent variables, namely Digital Technology Use (X1) and Product Innovation (X2), do not have a significant effect on the dependent variable, MSME Competitiveness (Y). In addition, the Sum of Squares Regression of 2.127 and the calculated F value of 1.185 are still relatively small, and the Sig. 0.344, which is the largest number (least significant) among all simultaneous tests conducted in this study) clearly shows that even the variation in Digital Technology Use (X1) and Product Innovation (X2) together cannot have a significant effect on MSME Competitiveness (Y).

Table 5. Partial Test Results (T)

		Coeffisients				
Model		Unstandardized Coefficients	Sandardized Coefficients	t	Sig	
		B	Std. Error	Beta		
1	constan	2.093	.977		2.142	.041
	Judul X1	.206	.187	.213	1.105	.279
	Judul X2	.157	.179	.169	.873	.390

The t-test results (Table 5) show that the use of digital technology (X₁) has a positive coefficient of 0.206 but is not significant (t = 1.105; sig. = 0.279 > 0.05), while product innovation (X₂) also has a positive but insignificant effect (coefficient 0.157; t = 0.873; sig. = 0.390 > 0.05). These two independent variables are partially unable to make a real contribution to improving the competitiveness of MSMEs. When combined with the F test results (sig. 0.344 > 0.05) and R Square of only 19.2%, it can be concluded that digital technology and product innovation are not yet the main determining factors of MSME competitiveness in this research sample; there is still 80.8% of competitiveness variation that is more influenced by other factors outside the model.

Table 6. Coefficient of Determination Test Results

		Model Summany			
Model	R	R Square	Adjust R Square	Std. Error	The Estimasi
1	.438 ^a	.192	.030	.599	

4. CONCLUSION

Based on the analysis results, it can be concluded that the use of digital technology (X1) and product innovation (X2), whether examined individually or together, does not have a significant effect on the competitiveness of MSMEs (Y) within the respondent group studied. This conclusion is supported by the significance value of the F test of 0.344, which is greater than 0.05, and an R Square value of 19.2 percent, indicating that most variations in MSME competitiveness are influenced by factors beyond the model. Despite this, a descriptive overview shows that all three variables received very

positive assessments from respondents. Digital technology was perceived as very easy to use with an average score of 4.55, while product innovation was considered strongest in improving existing products with the same mean score. Competitiveness also scored well, particularly in price-quality ratio, product durability, and repeat purchases, with an average of 4.42, although affordability remained a relative weakness at 4.29. These findings indicate that although MSMEs are capable of adopting technology and actively improving their products, these factors are not yet the primary determinants of competitiveness. To enhance competitiveness in the digital economy era, MSMEs also need more competitive pricing strategies, wider market access, stronger financial management, and comprehensive development support, as technology and innovation alone are not sufficient.

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