Article

Digitalization as a Strategy to Increase the Competitiveness of MSMEs in the Era of an Inclusive Economy

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A B S T R A C T

This research aims to investigate the main strategies in increasing the competitiveness and sustainability of micro, small, and medium enterprises (MSMEs) in the tourism sector in Medan City through digitalization and technological innovation in the framework of an inclusive economy. The focus of the research includes the use of digital technology in marketing, optimization of online reservation systems, the use of e-commerce platforms, and the application of service automation to increase operational efficiency and MSME revenue. Digitalization is seen as a strategic solution to overcome MSMEs' dependence on conventional methods in marketing, production, and business management which has been the main obstacle in facing competition with large companies and imported products. Based on data from the Medan City Cooperative Office, there are around 18,000 active MSMEs, but the level of digital adoption still varies. This study uses a quantitative method with purposive sampling techniques on 100 MSMEs from the souvenir, culinary, and handicraft subsectors that have interacted with local digitalization programs. Data were collected through a questionnaire survey and analyzed using Structural Equation Modeling with a Partial Least Squares (PLS-SEM) approach because the research variables were latent and construct-based. This approach allows testing of structural relationships as well as direct and indirect influences between variables. The novelty of this research lies in the development of the Conceptual Model of Inclusive Digitalization for SME Competitiveness (CDISC), which integrates digital inclusivity indicators—including digital access, digital literacy, and technological readiness—with MSME competitiveness indicators. The results of the research are expected to make a theoretical and practical contribution to the development of MSME digitalization policies that are sustainable, inclusive, and oriented towards increasing turnover, expanding market reach, and operational efficiency of MSMEs in Medan City.

Keywords: *MSMEs, Digitalization, Technologist Innovation, Competitiveness, Inclusive Economy, PLS-SEM, Medan City*

INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) are the backbone of the Indonesian economy. Based on data from the Ministry of Cooperatives and SMEs, MSMEs contribute 61% to the Gross Domestic Product (GDP) and absorb 97% of the national workforce. In addition, the number of MSMEs in Indonesia has reached more than 64 million business units, showing that this sector has a very strategic role in encouraging inclusive economic growth (1),(2),(3).

However, in the midst of the digital era and global competition, MSMEs face various challenges in increasing competitiveness. Lack of access to digital technology, low digital literacy, and limited capital and infrastructure are the main obstacles in the development of MSMEs. A study from the Institute for Development of Economics and Finance (4),(5),(6), stated that only 21% of MSMEs in Indonesia have made optimal use of digital technology in their business operations. As a result, many MSMEs still rely on conventional methods in marketing, production, and business management, making it difficult to compete with large companies and imported products.
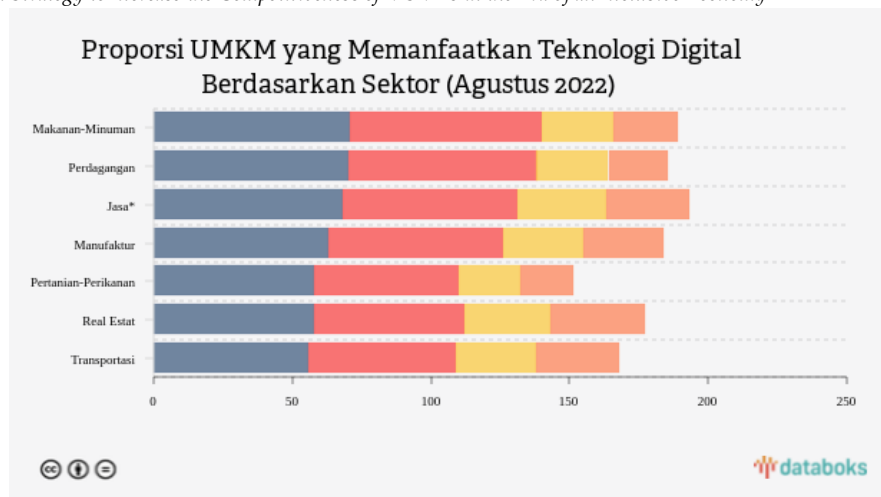
Figure 1. Proportion of MSMEs Utilizing Digital Technology
Source: Databoks.katadata.co.id

Sustainability One of the main challenges for MSMEs in Medan is the low adoption rate of digitalization. Although the potential of the digital market continues to grow, there are still many MSME players who have not optimized digital technology in their business operations. According to data from the Medan City Cooperatives and MSMEs Office, only about 30% of MSMEs have actively utilized digital platforms, both for marketing, transactions, and business management (7),(8),(9),(10).

Literature Review

Some of the factors that cause the low digitalization of MSMEs in Medan City include: First, Lack of Digital Literacy, Many MSME actors still do not understand how to utilize digital technology for business, such as e-commerce, social media, and digital payments. Second, Limited Infrastructure and Access to Capital, Not all MSMEs have access to adequate technological tools or capital to invest in digital transformation. Third, Fierce Competition, MSMEs in Medan face competition with large businesses that have already adopted digitalization and more competitive imported products. Fourth, Lack of Support and Mentoring, Although the government has provided MSME digitization programs, many business actors have not received enough assistance to understand and implement digital technology effectively (11),(12),(13),(14),(15).

Digitalization is the main strategy to increase the competitiveness of MSMEs, both at the local and national levels. The use of e-commerce, social media, artificial intelligence (AI), and digital payment systems can help MSMEs expand market reach, improve operational efficiency, and optimize marketing strategies. In the city of Medan, several programs have been promoted to support the digitalization of MSMEs, such as digital training by the Cooperatives and SMEs Office and collaboration with national marketplaces. However, the effectiveness of this program still needs to be further evaluated to ensure that all MSMEs can adapt to the digital era. Based on this phenomenon, this study aims to analyze the role of digitalization in increasing the competitiveness of MSMEs in the city of Medan, identify the challenges faced, and develop effective strategies in supporting the digital transformation of MSMEs in the inclusive economic era.

This study aims to analyze the role of digitalization in increasing the competitiveness of MSMEs in Medan City, identify the challenges faced, and develop effective strategies in supporting the digital transformation of MSMEs in the inclusive economic era. The main focus of the research is how the adoption of digital technology can empower MSMEs, to achieve sustainable and inclusive growth. Strategies to be explored include the use of digital platforms for wider marketing, the implementation of an efficient online reservation system, the use of e-commerce to reach the global market, and the implementation of service automation solutions to improve operational efficiency. In addition, this research will also analyze how technological innovations can help MSMEs overcome challenges such as seasonal income fluctuations and improve their ability to compete in an increasingly global market. With a

deeper understanding of the role of digitalization in strengthening the competitiveness of MSMEs, this research is expected to make a significant contribution in formulating policies and practices that support the growth of MSMEs in the city of Medan. Through a comprehensive methodological approach, including surveys, interviews, and data analysis of digitalization trends in the MSME sector, this study aims to present better insights into the dynamics and opportunities faced by MSMEs in adopting technology to improve their competitiveness in the era of an inclusive economy.

METHOD

This research aims to explore business sustainability in the MSME tourism sector in This research will adopt an in-depth analysis approach to identify key factors that play a role in the success of digitalization in increasing the competitiveness of MSMEs in Medan City. These factors include inhibiting and supporting factors in the implementation of digitalization, technological innovation, the use of digital technology and effective strategies in accelerating the digital transformation of MSMEs to increase competitiveness in the era of an inclusive economy, this research will produce valuable insights for the development of the right strategy.

This research is intended to identify the main strategies in increasing the competitiveness of MSMEs in the city of Medan through digitalization and technological innovation. This strategy includes the use of digital technology in marketing, optimization of online reservation systems, the use of e-commerce platforms, and the implementation of service automation to improve operational efficiency. In addition, this research will also explore how technological innovation can help MSMEs in overcoming the use of conventional methods in marketing, production, and business management, making it difficult to compete with large companies and imported products. and increasing their competitiveness which aims to increase the income of MSMEs in the city of Medan. Based on data from the Medan City Cooperative Office, the number of active MSMEs reached 18,000 units. This study uses a purposive sampling method to select 100 MSMEs from the souvenir, culinary, and handicraft subsectors, who have interacted with local digitalization programs. Data was collected through surveys using closed-ended questionnaires designed to collect information related to several important aspects. First, data on MSME profiles, including business size, length of operation, and type of business. Second, data on business practices that include marketing strategies, operational management, and collaboration with other parties. Third, data on the use of digital technology, which includes the digital platforms used, frequency of use, and the purpose of use such as marketing and inventory management. Finally, information on the implementation of sustainable practices, including waste management and other creative sustainability initiatives.

The collected data will be analyzed using SEM using the Partial Least Squares (PLS-SEM) approach to test the relationship between latent variables, as the data is a construct from the questionnaire results. This model allows testing of structural models and direct-indirect influences between variables. The novelty of this research lies in the development of the conceptual model CDISC (Conceptual Model of Inclusive Digitalization for SME Competitiveness) which combines digital inclusivity indicators (access, digital literacy, technological readiness) with competitiveness indicators (productivity, market reach, operational efficiency). This model has not been widely used in the context of Indonesian MSMEs, especially in second-tier cities such as Medan. Multiple linear regression is used to look at the relationship between independent variables (use of digital technology, digital innovation) and dependent variables (increased competitiveness), by examining linearity, homocedasticity, independence, and residual normality to ensure a proper regression model. In addition, correlation analysis is performed to measure the strength and direction of the relationship between two variables. Pearson Correlation is used to measure the linear relationship between two continuous variables
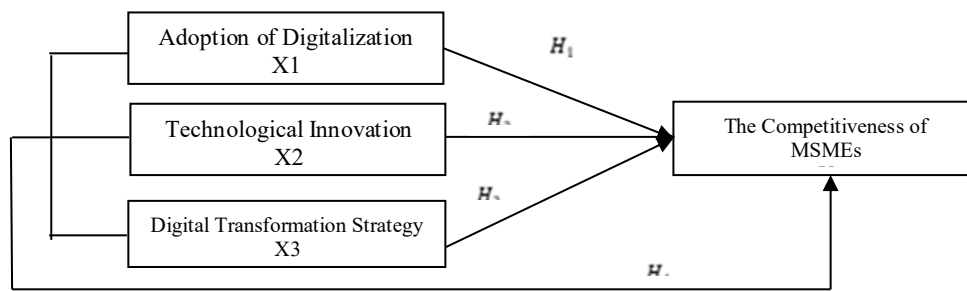
Figure 2. Conceptual Framework

Hipotesis

A hypothesis is a temporary question or the most likely conjecture that still needs to be sought. The relationship between variables in this study has the following hypothesis.

> *Digitalization adoption has an effect on increasing the competitiveness of MSMEs.*
>
> *Technological innovation is influential in increasing the competitiveness of MSMEs.*
>
> *The Digital Transformation Strategy has an effect on increasing the competitiveness of MSMEs.*

Validity and Reliability Tests

The validation of the statement on the instrument was carried out using the SmartPLS 4 program and tested on 35 respondents outside the research sample, provided that if the loading factor value shows > 0.7, the statement item is valid. Then cross loading has a correlation value between a component and its index greater than the correlation value with other components.

The reliability of the statement on the instrument is carried out by looking at the reliability value of the composite and *Cronbach's Alpha* which has a value of > 0.7 is said to be reliable. Then reliability is also carried out by looking at *the Average Variance Extracted* (AVE) value > 0.50, then the AVE value is considered to meet the reliability requirements.

Uji Hypothesis

Test the hypothesis by looking at the r-square of the intrinsic structure and the t-statistical test of the path coefficient. The higher the R-squared value, the better the prediction model of the proposed research model. The value of the path coefficient indicates the degree of significance in the hypothesis test.

FINDINGS AND DISCUSSION

Outer Model

Validity Test Results

The result of convergent validity is seen from the magnitude of the validity indicated by the loading factor value. The load factor shows a correlation between the unit score of the question and the score of the composition indicator.

Table 1. *Convergent Validity* Before Elimination

Variabel	Item	Outer Loading
Digitalization Adoption	AD.1	0.753
	AD.2	0.707
	AD.3	0.795
	AD.4	0.219
	AD.5	0.281
Technological Innovation	IT.1	0.663
	IT.2	0.827
	IT.3	0.912
	IT.4	0.616
	IT.5	0.822
Digital Transformation Strategy	STD.1	0.726
	STD.2	0.404
	STD.3	0.537

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|	STD.4	0.835
The Competitiveness of MSMEs	DS.1	0.789
	DS.2	0.736
	DS.3	0.825
	DS.4	0.758
	DS.5	0.602

Source: Smartpls Process Results (2025)

Based on table 1, there are 13 statement items that have a loading factor value greater than 0.7 which means they are valid while the rest must be eliminated.

Table 2. Convergent Validity After Elimination

Variabel	Item	Outer Loading
Digitalization Adoption	AD.1	0.753
	AD.2	0.707
	AD.3	0.795
Technological Innovation	IT.2	0.827
	IT.3	0.912
	IT.5	0.822
Digital Transformation Strategy	STD.1	0.726
	STD.4	0.835
	STD.5	0.800
The Competitiveness of MSMEs	DS.1	0.789
	DS.2	0.736
	DS.3	0.825
	DS.4	0.758

Source: smartpls Process Results (2025)
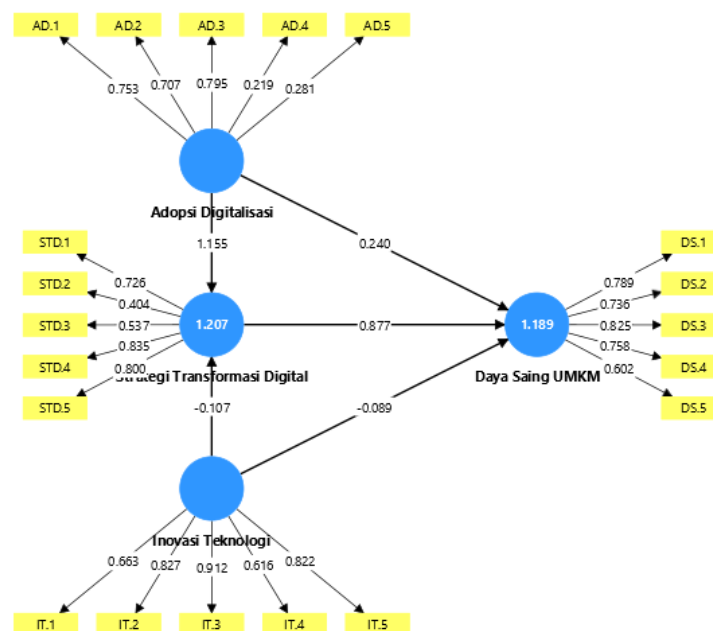
Source: smartpls Process Results (2025)
Gambar 3. Outer Loading

Based on table 2 and figure 3, after the item with a loading factor value of less than 0.7 is eliminated, all statement items that have a loading factor value greater than 0.7 are declared valid.

Reality Test

To evaluate the model, latent variables were measured with *Composite Reliability* and *Cronbach's Alpha values.* If the combination of the block of reliability indicators and *the Cronbach alpha* value is both above 0.7, the structure is declared reliable.

Tabel 3. Composite Reliability dan Cronbach's Alpha

Variabel	Composite Reliability	Cronbach's Alpha
Digitalization Adoption	0.798	0.787
The Competitiveness of MSMEs	0.868	0.860
Technological Innovation	0.896	0.880
Digital Transformation Strategy	0.839	0.797

Source: smartpls Process Results (2025)

Based on table 3, it shows that all constructs have good reliability because the *value of Composite Reliability* and *Cronbach's alpha* of all constructors is above the value of 0.7.

If the *Average Variance Extracted* (AVE) value is above 0.50, the extract is eligible. The results of the test of the average value of variance Extract can be seen in the following table:

Tabel 4. Average Variance Extracted

Variabel	Average Variance Extracted
Integrity of Creative Initiatives	0.865
The Success of MSMEs	0.556
Use of Digital Technology	0.603
Sustainable Practices	0.664

Source: smartpls Process Results (2025)

The results of the Average Variance Extracted value in the table above show the Average Variance Extracted value >0.50 so that the construct is qualified. The next step is to compare the square root of the Ave with the correlation between the constraints in the model.

Tabel 5. Correlation Value Between Constrak and Square Root Value of Ave

Digitalization Adoption	The Competitiveness of MSMEs	Technological Innovation	Digital Transformation Strategy
0.908			
0.672	**0.614**		
0.645	0.654	**0.780**	

Source: smartpls Process Results (2025)

Based on table 5, the correlation value between the square root contracts of AVE shows that in each contract it is greater than the other limits. The category of discriminant validity qualifies.

Inner Model

The inner model can be solved by looking at the Rsquare for endogenous constraints and the Statistical values of the path coefficient test. The higher the r-square value, the better the prediction model of the proposed research model. The value of the path coefficient indicates a significant level in the hypothesis test.

Determined

The determination test is a test carried out to determine the influence of exogenous variables on endogenous variables.

Table 6. R Square Value

Variabel	R Square
The Competitiveness of MSMEs	0.734

Source: smartpls Process Results (2025)

Based on the results of the R-square value in table 5, it is obtained how much the

success of MSMEs can be influenced by exogenous variables. Its R-squared is 0.734. This shows that 73.4% of MSME success variables are the impact of digital technology use variables, sustainable practices, and the integration of creative initiatives, while the other 26.6% are influenced by other causes.

Uji Hypothesis

The stages of hypothesis testing are shown in the following table:

Tabel 7. Path Coefficients Result (Direct Effect)

Hypothesis	T- Statistics (O/STDEV)	P-Values	Description
(HI) AD ->DS	1,181	0.119	Accepted
(H2) IT ->DS	1,349	0.207	Accepted
(H3) STD-> DS	1,069	0.129	Accepted

Source: smartpls Process Results (2024)

The Influence of Digitalization Adoption on the Competitiveness of MSMEs

The results of the hypothesis test (H_1) obtained a t-statistical value of 1.181 < 1.96 and a p_{value} of 0.119> 0.05. The test results had a positive and significant effect, so the first hypothesis was accepted. This shows that the adoption of digitalization has an effect on the competitiveness of MSMEs in the inclusive economic era.

The Influence of Technological Innovation on the Competitiveness of MSMEs

The results of the hypothesis test (H_2) obtained a t-statistical value of 1.349 < 1.96 and a p_{value} of 0.207> 0.05. The test results had a positive and significant effect, so the second hypothesis was accepted. This shows that technological innovation has an effect on the competitiveness of MSMEs in the inclusive economic era.

The Influence of Digital Transformation Strategies on the Competitiveness of MSMEs

The results of the hypothesis test (H_3) obtained a t-statistical value of 1.069 < 1.96 and a p_{value} of 0.129> 0.05. The test results had a positive and significant effect, so the third hypothesis was accepted. This shows that digital transformation strategies have an effect on the competitiveness of MSMEs in the inclusive economic era.

CONCLUSION

Based on the results of the analysis and discussion, this study concludes that digitalization is an effective and significant strategy in increasing the competitiveness of MSMEs in the inclusive economic era, where the adoption of digitalization, technological innovation, and digital transformation strategies has been proven to have a positive effect on increasing the competitiveness of MSMEs. The use of digital technology such as e-commerce platforms, social media, non-cash payment systems, and financial recording applications is able to expand market reach, increase operational efficiency, and strengthen relationships with consumers, while helping MSMEs adapt to changes in market behavior that are increasingly technology-based. However, this study also reveals challenges in the form of limited digital literacy, capital, and human resources that cause not all MSMEs to be able to optimize digitalization opportunities, thus causing a gap in digital transformation readiness. Therefore, digitalization in the context of an inclusive economy needs to be supported by MSME capacity building, conducive government policies, and a collaborative digital ecosystem. Overall, this study emphasizes that digitalization is not just a trend, but a strategic need to ensure the sustainability, resilience, and competitiveness of MSMEs in the face of increasingly competitive economic competition.

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