



MSMEs and the Role of Technology in Achieving Business Sustainability

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Abstract

This study investigates the impact of Artificial Intelligence (AI) and Financial Technology (FinTech) on business sustainability among Micro, Small, and Medium Enterprises (MSMEs) in Medan City. Employing an associative research approach, the study utilizes quantitative data derived from both primary and secondary sources. The analysis methods include descriptive statistical analysis and Structural Equation Modeling (SEM). The study's population consists of 100 MSMEs in Medan City, selected through accidental sampling. The findings demonstrate that the adoption of AI and FinTech positively and significantly influences business sustainability. The integration of these technologies enhances operational efficiency, supports faster growth, and ultimately strengthens the sustainability of MSMEs. This research highlights the critical role of digital innovation in driving the development and resilience of small businesses, emphasizing the need for broader adoption of AI and FinTech solutions in the MSME sector to foster long-term growth and competitiveness.

Keywords: Artificial Intelligence; Business Sustainability; Financial Technology; MSMEs; Structural Equation Modeling

1. Introduction

Micro, Small, and Medium Enterprises (MSMEs) are the backbone of Indonesia's economy, contributing significantly to job creation and poverty alleviation. Their importance is underscored by the fact that they play an irreplaceable role in the economic development of the nation. The MSME Business Index, for example, showed an optimistic growth from 104.6 to 109.4 in 2020, reflecting the positive trajectory of these enterprises. However, beneath these optimistic figures lies untapped potential that is often constrained by limited access to technology and inadequate digital literacy[1]. Despite their significant contribution, many MSMEs struggle to fully maximize their growth potential due to the barriers in adopting modern technological solutions.

Micro, Small, and Medium Enterprises (MSMEs) are businesses that operate on a small to medium scale, usually characterized by their limited number of employees, revenue, and assets[8]. As the digital era advances, the transformation of MSMEs is no longer optional; it is a necessity. One of the key factors in overcoming these barriers is the adoption of Artificial Intelligence (AI) and Financial Technology (FinTech). AI, with its ability to analyze data, automate processes, and predict trends, can drastically enhance operational efficiency and provide a competitive edge for MSMEs. [3] Similarly, FinTech enables more efficient financial management, including easier access to capital, secure transactions, and better financial planning. However, while access to these technologies is crucial, it is equally important to recognize the role of financial literacy in ensuring their effective use. [5] The solution to these challenges is not merely about access to capital but a paradigm shift toward leveraging technology and improving financial literacy[10].

Business sustainability is the ability of a business to survive and grow in the long term while considering economic, social, and environmental aspects. It includes practices aimed at improving efficiency, reducing negative environmental impacts, and providing social benefits to the community. [6] This research aims to examine the impact of the use of Artificial Intelligence and Financial Technology on the business sustainability of MSMEs in Medan City. By exploring how these technological advancements can improve efficiency, competitiveness, and financial decision-making, this study will provide valuable insights into how MSMEs can navigate the challenges of the digital age and ensure long-term sustainability[7].

2. Research Methods

2.1. Research Design

The type of research conducted in this study is quantitative descriptive research. This study aims to explain the relationship or influence between the independent variable, dependent variable, and intervening variable being studied. [2]

2.2. Place and Time of Research

This research is conducted in Medan City, North Sumatra, and is scheduled to take place from August to September 2024.

2.3. Population and Sample

The population of this study consists of MSMEs in Medan City that have already adopted AI and Financial Technology in their business operations. The sampling method used is accidental sampling with 100 respondents.

2.4. Research Instrumen

In this study, data collection was carried out by distributing questionnaires to respondents. The scale used for this research is the Likert scale. the Likert scale is used to measure attitudes and opinions with a range from 1 to 5[2]:

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

Table 1: Variable and Indicators

NO	Variable	Indicators
1	Use Of Artificial Intelgence	<ul style="list-style-type: none"> 1. Reducing manual workload. 2. Enhancing operational efficiency. 3. Minimizing human error. 4. Analyzing data at high speed. 5. Providing data-driven decision recommendations. 6. Delivering a personalized customer experience. 7. Facilitating customer interactions through chatbots. 8. Increasing customer loyalty through tailored services. 9. AI significantly reduces operational costs. 10. Boosting productivity without increasing human resources.
2	Use Of Financial Technology	<ul style="list-style-type: none"> 1. Ease of access to digital financial services. 2. User-friendliness of fintech applications. 3. Wide-ranging financial service availability. 4. Fast and instant transaction processing. 5. Transaction costs are lower compared to traditional methods. 6. Ease of monitoring financial activities. 7. Protection of user data from cyber threats. 8. Transparency in the protection of personal data. 9. User trust in the security of fintech services. 10. The ability to manage finances anytime and anywhere. 11. Ease of managing business cash flow through fintech applications. 12. Access to fintech for individuals without bank accounts. 13. Utilizing fintech to reach remote communities. 14. More efficient access to financial services
3	Business Sustainability	<ul style="list-style-type: none"> 1. Stable business revenue: Consistent income generation through sustainable business practices and diversified revenue streams. 2. Efficient cost management: Optimizing operational expenses to improve profitability while maintaining quality and productivity. 3. Harmonious relationship with the local community: Fostering positive connections and mutual support with the surrounding community to create shared value. 4. Employee well-being: Ensuring the health, safety, and career satisfaction of employees by offering a conducive work environment and fair compensation. 5. Positive contribution to society: Actively engaging in initiatives that benefit society and support local development, enhancing corporate social responsibility. 6. Adaptability to market changes: Demonstrating flexibility and responsiveness to market dynamics, industry shifts, and customer preferences. 7. Product innovation to meet customer needs: Continuously developing and improving products to

	align with changing consumer demands and technological advancements.
8.	Operational risk mitigation: Identifying potential risks and implementing proactive measures to minimize their impact on business operations.
9.	Strategic planning to navigate market challenges: Developing long-term strategies to anticipate and address market challenges while positioning the business for sustained growth.

2.5. Analysis Result

To determine and analyze the effect of the use of artificial intelligence and the use of financial technology on business sustainability in SMEs in Medan, we examine it at a significance level of 10%.

2.6. Data Analysis Techniques

From the observations made by the observers through the prepared observation sheets, data is obtained from the observation results and reflects the findings of the research at the time the study is conducted. After all the data is collected by the researcher, it will be processed into statistical data and then described scientifically to obtain the research results.

3. Result and Discussion

3.1. Descriptive Statistical Analysis of Respondents

Table 2: Descriptive Statistical Analysis

No	Description	Details	Total (n)	Percentage (%)	Total
1	Gender	• Male	79	79%	100
		• Perempuan	21	21%	
		• > 20 Years	5	5%	
2	Age	• 21-30 Years	25	25%	
		• 31 - 40 Years	37	37%	
		• 41 - 50 Years	27	27%	
		• < 50 Years	6	6%	
3	Sales	• > 30 Million IDR	75	75%	
		• 31-100 Million IDR	18	18%	
		• 101-200 Million IDR	5	5%	
		• < 200 Million IDR	2	2%	
4	Duration Of Business	• < 1 Years	27	27%	
		• 2-5 Years	47	47%	
		• 6-10 Years	21	21%	
		• > 10 Years	5	5%	
5	Education Level	• Elementaru School	7	7%	
		• Middle School	15	15%	
		• Hight School	70	70%	
		• Diploma / Bachelor's Degree	8	8%	
6	Business Sector	• Culinary	34	34%	
		• Fashion	18	18%	
		• perdagangan	42	42%	
		• Jasa	6	6%	

3.2. Full Structural Model Data

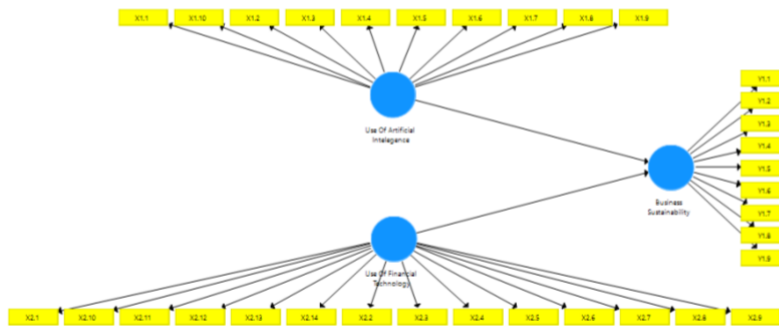


Fig. 1: Full Model Structural Data

3.3. Outer Model Evaluation Data

3.3.1. Validit Test

a. Outer Loading Test

The testing with convergent validity shows that all indicators meet the criteria with values greater than 0.4, as seen in the image below

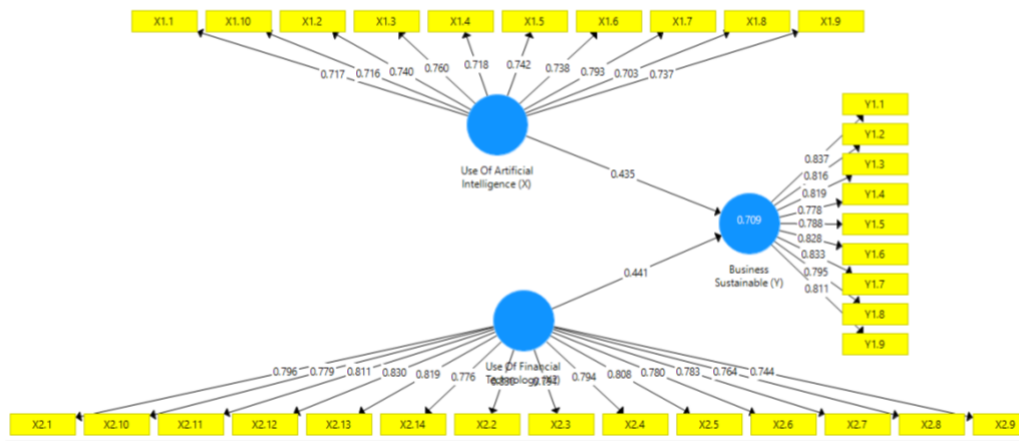


Fig. 1: Loading Factor Full Model

b. AVE (Average Variance Extracted)

The testing with convergent validity shows that all indicators meet the criteria with values greater than 0.4, as seen in the image below

Table 3: AVE (Average Variance Extracted)

	Average Variance Extracted (AVE)
Use Of Artificial Intelligence (X1)	0.659
Use Of Financial Technology (X2)	0.543
Business Sustainable (Y)	0.630

3.3.2. Reliability Test

The testing with convergent validity shows that all indicators meet the criteria with values greater than 0.4, as seen in the image below.

Table 4: Composite Reliability

	Composite Reliability
Use Of Artificial Intelligence (X1)	0.659
Use Of Financial Technology (X2)	0.543
Business Sustainable (Y)	0.630

3.3.3. Discriminant Validity Test

The discriminant validity test using the Fornell-Larcker criterion shows that each variable has an AVE (Average Variance Extracted) square root value greater than the correlation between the variables. Thus, the discriminant validity test is met [4].

Table 5: Fornell-Larcker Criterion

Fornell-Larcker Criterion	Business Sustainable (Y)	Use Of Artificial Intelligence (X1)	Use Of Financial Technology (X2)
Use Of Artificial Intelligence (X1)	0.812		
Use Of Financial Technology (X2)	0.808	0.737	
Business Sustainable (Y)	0.809	0.845	0.794

3.4. Inner Model Evaluation Data

3.4.1. Correlation Test of Variables in the Structural Model

Multicollinearity test provides insights into the impact of collinearity on exogenous variables in the structural model. Potential collinearity issue arises when the VIF (Variance Inflation Factor) value is $\geq 3 - 5$, whereas collinearity is considered acceptable when the VIF value is < 3 [4].

Table 6: Colinearity Statistic

Fornell-Larcker Criterion	Business Sustainable (Y)	Use Of Artificial Intelligence (X1)	Use Of Financial Technology (X2)
Use Of Artificial Intelligence (X1)			
Use Of Financial Technology (X2)	3.495		
Business Sustainable (Y)	3.495		

3.4.2. Quality Model Test

a. R square

Table 7: R Square

	R Square	R Square Adjusted
Financial Behaviour	0.709	0.703

The table shows the R Square and Adjusted R Square values for the dependent variable, Financial Behavior (Y). The R Square value of 0.709 indicates that approximately 70.9% of the variation in financial behavior is explained by the model, while the Adjusted R Square value of 0.703 accounts for the number of predictors used in the model, slightly adjusting for overfitting.

b. f square

Table 8: f Square

Fornell-Larcker Criterion	Business Sustainable (Y)	Use Of Artificial Intelligence (X1)	Use Of Financial Technology (X2)
Use Of Artificial Intelligence (X1)			
Use Of Financial Technology (X2)	0.186		
Business Sustainable (Y)	0.191		

The F-square values in the table show the effect size of the independent variables on the dependent variable. The values of 0.186 and 0.191 indicate that both Use of Artificial Intelligence (X1) and Use of Financial Technology (X2) have a moderate effect on Business Sustainability (Y), with Use of Artificial Intelligence having a slightly stronger effect.

c. SRMR (Standardised Root Mean Square Residual)

Table 9: SRMR (Standardised Root Mean Square Residual)

	Saturated Model	Estimated Model
SRMR (Standardised Root Mean Square Residual)	0.064	0.064
NFI (Normed-fit Index)	0.651	0.651

The model quality testing using SRMR (Standardized Root Mean Square Residual) and NFI (Normed-fit Index) shows that the SRMR model estimate is $0.064 < 0.1$, indicating that the estimated model's correlation matrix fits well with the empirical data correlation matrix. Additionally, the NFI model estimate is $0.651 > 0.5$, meaning the model used is acceptable.

3.4. Significance Test of Influence

Table 10: Colinearity Statistic

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics ((O/STDEV))	P Values
Use Of Artificial Intelligence (X) -> Business Sustainable (Y)	0.435	0.435	0.138	3.159	0.001

Use Of Financial Technology (X2) -> Business Sustainable (Y)	0.441	0.447	0.137	3.231	0.001
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The table above shows the results of hypothesis testing for the influence of "Use of Artificial Intelligence (X)" and "Use of Financial Technology (X2)" on "Business Sustainability (Y)." The original sample coefficients (O) for both variables are 0.435 and 0.441, indicating a positive relationship with business sustainability. The t-statistics for both relationships are greater than 2, with values of 3.159 and 3.231, respectively, which are significant at the 0.001 level (p -value < 0.05). These results suggest that both the use of Artificial Intelligence and Financial Technology have a significant positive impact on business sustainability.

4. Conclusion

The results indicate that both Artificial Intelligence (AI) and Financial Technology (FinTech) significantly affect business sustainability in MSMEs. The coefficients of 0.435 for AI and 0.441 for FinTech, along with t-statistics of 3.159 and 3.231 respectively, demonstrate a strong positive relationship between the use of these technologies and the sustainability of MSMEs. These findings suggest that adopting AI and FinTech solutions allows MSMEs to optimize operational efficiency, reduce costs, and make more informed decisions crucial components for long-term business viability.

From an operational perspective, MSMEs should prioritize the implementation of AI and FinTech as part of their strategic business processes. AI can be operationalized by automating tasks such as customer service through chatbots, predictive analytics for business trends, and optimizing supply chains to reduce inefficiencies[9]. On the other hand, FinTech can be operationalized by integrating digital payment systems, offering financial management tools, and utilizing online platforms to provide easier access to credit and financial services. To operationalize these technologies effectively, MSMEs should invest in staff training, develop partnerships with tech providers, and adopt scalable solutions that fit their business models. Regular assessment of the impact of these technologies should be part of their continuous improvement efforts to ensure they remain competitive and sustainable.

5. Advice

The suggestions that can be conveyed from the results of this study are as follows:

1. For MSMEs
 - a. MSMEs should immediately adopt and invest in technologies such as AI and FinTech to improve operational efficiency and business competitiveness. The use of AI can assist in automating tasks, while FinTech can provide ease in managing finances and digital transactions.
 - b. MSMEs need to ensure that their employees possess the necessary skills to fully utilize these technologies. Therefore, training and human resource development should be a priority to ensure successful technology implementation
2. For Researcher
 - a. Expanding the Research: Future research can expand the sample by involving MSMEs from various industries and regions to obtain more comprehensive results regarding the adoption of AI and FinTech.
 - b. Analysis of Other Factors: Future studies could explore other factors that influence the sustainability of MSMEs, such as government policies, access to capital, and socio-economic factors.

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