International Journal of Environmental Sciences
ISSN: 2229-7359
Vol. 11 No. 5, 2025
https://theaspd.com/index.php

Digital Transformation, Strategy, and Capital Readiness: Impact on MSME Financial Performance

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ABSTRACT

This study aims to examine the influence of digital transformation, business strategy, and structural capital readiness on the financial performance of Micro, Small, and Medium Enterprises (MSMEs) in North Sumatra. Specifically, it explores the mediating role of accounting information system (AIS) adoption in this relationship. Using a quantitative approach, the study employs Structural Equation Modeling–Partial Least Squares (SEM-PLS) and cluster analysis to analyze data collected from MSME actors in the region. The results indicate that digital transformation, business strategy, and structural capital readiness have a significant and positive impact on MSMEs' financial performance. Moreover, the adoption of AIS significantly mediates these relationships by enhancing efficiency, financial transparency, and decision-making quality. The study concludes that digital and strategic readiness, supported by AIS implementation, is crucial for improving financial outcomes. It recommends that MSMEs invest in digital capabilities, strengthen organizational infrastructure, and develop integrated strategies to remain competitive in a digital economy. These findings offer practical implications for business owners, policymakers, and technology providers to jointly support MSME growth through targeted digital and strategic interventions.

Keywords : *Digital Transformation, Business Strategy, Structural Capital Readiness, Accounting Information Systems, Financial Performance, MSMEs, SEM-PLS.*

INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) are a critical pillar of the Indonesian economy, contributing approximately 61% to the national Gross Domestic Product (GDP), equivalent to IDR 9,580 trillion. They also absorb around 97% of the labor force, employing approximately 117 million workers, with a total of 66 million business units recorded in 2023. This represents a 1.52% growth from the previous year, with a notable surge of 2.28% in 2021 (Indonesian Chamber of Commerce and Industry, 2023).

Despite their substantial numbers, the economic contribution of Indonesian MSMEs remains relatively low. Comparatively, countries like the United States, with only 32 million MSMEs, contribute USD 56,800 per enterprise, and China, with 23 million MSMEs, contributes USD 8,690 per enterprise. In contrast, Indonesia's 66 million MSMEs generate an average contribution of merely USD 3,540 (SME Finance Forum, 2024). This indicates significant under-optimization in the economic value added by Indonesian MSMEs.

One of the main constraints hindering MSME development is limited access to financing. According to the Indonesian Joint Funding Fintech Association (2023), approximately 46.6 million MSMEs still lack access to capital, with a projected credit gap of IDR 2,400 trillion by 2026. Adequate financing is essential for both operational sustainability and business expansion. However, MSMEs often struggle with suboptimal financial performance due to various operational challenges.

A critical but frequently overlooked aspect is the adoption of accounting information systems (AIS). Theoretically, AIS should provide timely, accurate, and relevant financial data for effective decision-making (Hehanussa, 2024). However, many MSMEs still rely on manual bookkeeping or use inadequate accounting systems (Tan & Taufik, 2023; Adiningrat et al., 2023; Rosmida et al., 2024). Contributing factors include limited knowledge, poorly defined procedures, insufficient data, inadequate IT infrastructure, and weak internal controls. Implementing robust AIS can significantly enhance financial performance by improving financial management capabilities.

Despite various initiatives to improve AIS utilization among MSMEs, progress remains limited. Digital technology adoption is widely regarded as a transformative factor capable of reshaping AIS and enhancing financial performance (Herman et al., 2023). Digital transformation refers to the integration of digital technologies across all business functions, altering operations and delivering enhanced customer value. Tools such as e-commerce platforms, accounting software, and social media can improve operational efficiency and expand market reach (Chan, 2020; Jabonete & De Leon, 2022). Through increased productivity and cost efficiency, digital adoption has a positive impact on MSME financial outcomes.

An effective business strategy is also vital. A sound strategy encompasses financial planning, administrative innovation, organizational development, capability building, access to information, managerial development, and technological advancement (Kareem et al., 2024). Prior studies have affirmed that effective strategies improve competitiveness and performance (Latifah et al., 2020; Hutahayan, 2020; Nassani et al., 2023).

Moreover, structural capital readiness is crucial for ensuring that MSMEs possess the necessary resources to operate efficiently. Structural capital comprises databases, organizational structures, standard operating procedures, strategies, routines, and supporting technology (Fakhimuddin et al., 2021). Studies have shown that sound structural capital enhances operational effectiveness, particularly when leveraged to support AIS implementation (Shahzad et al., 2012; Hejazi et al., 2016).

Digital transformation, therefore, can improve AIS quality and, consequently, financial performance (BinSaeed et al., 2023; Xu et al., 2024; Martínez-Caro et al., 2020). Several studies confirm that AIS mediates the relationship between digital adoption and financial performance (Saleh & Al-Nimer, 2022; Huy & Phuc, 2021; Winarsih et al., 2024). Similarly, AIS also mediates the impact of business strategies on performance outcomes (Kareem et al., 2024; Latifah et al., 2020; Hutahayan, 2020). Structural capital, in turn, strengthens the operational efficiency of AIS, leading to better financial results (Daat et al., 2021).

Financial performance is a primary indicator of MSME success, reflecting both business growth and market resilience. Well-performing MSMEs can withstand competition and sustain operations in dynamic environments. Empirical evidence shows that AIS adoption improves operational efficiency and financial management, enabling MSMEs to monitor cash flow, reduce accounting errors, and make more informed decisions—resulting in increased profitability and asset growth (Daat et al., 2021). However, reliance on manual accounting methods remains prevalent, hampering the accuracy and timeliness of financial data and leading to suboptimal business decisions.

The interplay among digital transformation, business strategy, and structural capital readiness significantly influences MSME financial performance. The Diffusion of Innovation Theory posits that digital adoption enhances operational efficiency and competitive advantage (Cunningham et al., 2023), but its full potential is only realized with a well-integrated AIS (DeLone & McLean, 1992). Furthermore, the Resource-Based View (RBV) suggests that strategic resources such as innovation and information systems underpin competitive advantage (Barney & Clark, 2007). Business strategies involving administrative and technological innovations can only be effective if supported by high-quality AIS (Kareem et al., 2024).

Likewise, structural capital—encompassing technological infrastructure and information systems—supports resource management and strategic execution. RBV highlights intellectual capital as a source of competitive advantage, yet the ability to translate this into financial performance depends largely on the effective use of AIS (Daat et al., 2021).

In conclusion, AIS adoption is pivotal in enhancing the financial performance of Indonesian MSMEs. It mediates the effects of digital transformation, strategic planning, and structural capital readiness by enabling accurate financial reporting, improving efficiency, and supporting strategic decision-making. An integrated AIS ensures optimal implementation of digital and strategic initiatives, thereby maximizing their impact on financial performance.

LITERATURE REVIEW

1. Digital Transformation and Financial Performance of MSMEs

Digital transformation plays a significant role in enhancing the financial performance of Micro, Small, and Medium Enterprises (MSMEs), as elaborated by the Diffusion of Innovation Theory. This theory posits that innovation adoption is influenced by communicators who receive messages through mass media and subsequently affect others to adopt the innovation (Lazarsfeld et al., 1948). Rogers further refines this by identifying five key attributes influencing technology adoption: relative advantage, compatibility, complexity, trialability, and observability (Mohammadi et al., 2018). Technologies perceived to offer higher relative advantages, compatibility with users' values and needs, ease of use, and visibility are more likely to be adopted through advancements in information technology, computing, communication, and connectivity (Mangifera & Mawardi, 2022).

The application of the Diffusion of Innovation Theory illustrates how MSMEs progress through stages of digital transformation, beginning with awareness and knowledge of new technologies. This is followed by forming a belief in the benefits, aligning with their business strategy and structural capital readiness. The decision to adopt digital technologies is made when MSMEs perceive clear benefits, which then leads to implementation—particularly within accounting systems. Finally, the confirmation stage is reached when improvements in financial performance validate the technology adoption.

Several studies have demonstrated the positive impact of digital transformation on MSME financial performance. For instance, Al-Razgan et al. (2021) found that MSMEs adopting digital technologies experience enhanced operational efficiency and competitiveness. Similar findings by BinSaeed et al. (2023), Xu et al. (2024), and Zhang et al. (2024) highlight that digital adoption leads to improved efficiency, reduced operational costs, and broader market reach.

Drawing from theory and empirical evidence, digital transformation positively influences MSME financial performance. The adoption of digital technologies is expected to provide relative advantages such as increased efficiency, effectiveness, and competitiveness in an increasingly digital business environment. Through the integration of digital technologies into accounting information systems, MSMEs can enhance their financial literacy and management, thereby supporting business growth and sustainability.

Hypothesis 1 (H1): Digital transformation significantly influences the financial performance of MSMEs in North Sumatra.

2. Business Strategy and Financial Performance of MSMEs

Business strategy is a critical determinant of MSME financial performance, as articulated by the Resource-Based View (RBV) theory. RBV identifies organizational resources as key elements in formulating and implementing strategies that enhance a firm's efficiency and effectiveness (Barney & Clark, 2007). This perspective underscores the importance of internal resources in building sustainable competitive advantages, including financial sources, administrative innovation, organizational culture development, managerial capabilities, information sources, managerial development, and technological innovation (Kareem et al., 2024).

Several studies affirm that well-formulated business strategies, supported by adequate structural capital, contribute positively to MSME financial outcomes. For example, research by Kareem et al. (2024), Latifah et al. (2020), and Hutahayan (2020) emphasizes that effective management of internal and external resources enables MSMEs to achieve and maintain strong competitive positions. Structural capital—such as organizational databases, structures, and process guidelines—provides the foundation for supporting business strategy and technology implementation, thereby influencing financial performance (Daat et al., 2021).

Based on RBV theory and prior empirical findings, business strategy positively affects MSME financial performance. MSMEs that adopt strategies emphasizing the effective use of internal resources are likely to exhibit stronger financial outcomes. The interplay between business strategy and financial performance establishes a robust value chain that equips MSMEs to navigate dynamic market competition.

Hypothesis 2 (H2): Business strategy significantly influences the financial performance of MSMEs in North

Sumatra.

3. Structural Capital and Financial Performance of MSMEs

Structural capital plays a pivotal role in enhancing the financial performance of MSMEs, as explained within the RBV theoretical framework. RBV considers organizational resources—including intellectual capital such as knowledge, experience, and technological capabilities—as essential components in achieving competitive advantage (Barney & Clark, 2007). Intellectual capital serves not only as a reservoir of knowledge but also forms the foundation of core competencies that impact competitiveness and sustainability.

Several empirical studies have analyzed how structural capital readiness—a component of intellectual capital—can affect financial performance. Structural capital refers to the organizational structures, processes, and systems that enable effective resource management and decision-making (Daat et al., 2021; Fakhimuddin et al., 2021; Hejazi et al., 2016). Research indicates that MSMEs with well-organized structures and supportive systems are more effective in implementing business strategies and leveraging technologies, such as accounting information systems, to improve operational efficiency and ultimately financial performance (Daat et al., 2021).

Based on theoretical and empirical evidence, structural capital positively influences MSME financial performance. MSMEs possessing strong structural capital—characterized by organized organizational structures and efficient management systems—tend to demonstrate superior financial outcomes compared to those lacking such capacities. Utilizing RBV as a theoretical foundation, this study clarifies the significance of managing structural capital within the MSME context and highlights how effective intellectual capital management contributes to achieving strategic objectives, including financial performance enhancement.

Hypothesis 3 (H3): Structural capital significantly influences the financial performance of MSMEs in North Sumatra.

4. Adoption of Accounting Information Systems and Financial Performance of MSMEs

The adoption of accounting information systems (AIS) plays a pivotal role in enhancing the financial performance of micro, small, and medium enterprises (MSMEs), as emphasized by Information Economics Theory. This theory highlights the importance of accurate and relevant information in ensuring efficiency and effectiveness in organizational decision-making processes. In the context of AIS, the theory suggests that the proper design and implementation of such systems can generate reliable financial information, which in turn strengthens stakeholder trust and improves operational efficiency (Al-Dalabih, 2018).

Empirical studies further support the significant influence of AIS on the financial performance of MSMEs (Weygandt et al., 2019; L. S. Nguyen & Tran, 2019; Al Shanti & Elessa, 2023). When MSMEs are equipped with timely and accurate financial reports, they are better positioned to identify areas requiring cost savings or additional investment, optimize fund allocation, and strategically plan for business development. Effective AIS implementation enhances the accuracy of financial reporting, expedites decision-making processes, and contributes positively to overall financial outcomes.

Drawing from theoretical frameworks and prior empirical evidence, it can be posited that the adoption of AIS positively affects MSME financial performance. The integration of AIS not only improves profitability and operational efficiency but also facilitates stronger control over financial resources and more effective risk management. This leads to the formulation of the following hypothesis:

Hypothesis 4 (H4): The adoption of accounting information systems has a significant effect on the financial performance of MSMEs in North Sumatra.

5. Digital Transformation and Financial Performance through the Adoption of AIS

Digital transformation significantly contributes to the financial performance of MSMEs through the adoption of accounting information systems. According to the Diffusion of Innovation Theory, technology adoption within organizations is influenced by perceptions of relative advantage, compatibility with existing organizational values and needs, as well as factors such as technological complexity and observability (Mohammadi et al., 2018). In the MSME context, digital transformation begins with awareness of new technologies, followed by persuasion regarding their strategic and operational benefits, facilitated by

structural capital readiness. Once MSMEs recognize the value of digital tools, AIS adoption occurs, culminating in integration and confirmation when tangible improvements in financial performance are realized (Tornatzky et al., 1990).

Aligned with Information Economics Theory, AIS—when properly implemented—can deliver high-quality financial information, thereby improving operational efficiency and fostering stakeholder confidence (Al-Dalabih, 2018). Several studies affirm that digital technology adoption enhances the quality of AIS, which in turn improves the quality of accounting information and positively impacts financial performance (BinSaeed et al., 2023; Xu et al., 2024; Martínez-Caro et al., 2020; Zhang et al., 2024). These findings highlight the importance of investing in suitable digital technologies and information systems to boost MSME competitiveness and sustainability in increasingly dynamic markets (Nassani et al., 2023; Saleh & Al-Nimer, 2022; Huy & Phuc, 2021; Winarsih et al., 2024).

Based on the theoretical foundation and empirical literature, digital transformation is recognized as a critical enabler of improved financial performance through AIS adoption. MSMEs that have adopted digital AIS solutions are able to produce timely and accurate monthly financial reports, outperforming their counterparts who rely on manual bookkeeping. These systems provide analytical tools that facilitate faster and more informed financial decisions, enabling MSMEs to identify market trends and respond accordingly. Consequently, digital transformation contributes to operational efficiency and optimal resource utilization, ultimately enhancing business financial performance. This leads to the following hypothesis:

Hypothesis 5 (H5): Digital transformation significantly affects the financial performance of MSMEs in North Sumatra through the adoption of accounting information systems.

6. Business Strategy and Financial Performance of MSMEs through the Adoption of AIS

Business strategy plays an essential role in improving MSME financial performance through the adoption of accounting information systems. The Resource-Based View (RBV) emphasizes that internal resources—such as administrative innovation, organizational culture, and technological advancement—are key to achieving sustainable competitive advantage (Barney & Clark, 2007). RBV underscores the strategic management of these resources as critical to the effective execution of business strategies.

Information Economics Theory further supports the strategic value of high-quality information for decision-making. It argues that reliable financial information—enabled through well-designed AIS—enhances operational efficiency and builds stakeholder trust (Akerlof, 1970). Such systems can elevate the strategic decision-making capabilities of MSMEs, enabling them to respond more accurately and swiftly to changing market conditions.

Previous studies indicate that AIS serves as a mediating variable in the relationship between business strategy and financial performance. Research by Kareem et al. (2024), Latifah et al. (2020), and Hutahayan (2020) supports the notion that AIS adoption strengthens the positive effect of strategic initiatives on financial outcomes.

The integration of AIS within business strategy is not merely a technological initiative but a managerial approach that empowers MSMEs to be more responsive and adaptive. AIS enables resource efficiency through automation, improves the precision of financial information, and supports real-time decision-making through advanced data analytics. Thus, the strategic integration of AIS not only transforms financial management processes but also adds substantial value to financial performance. Accordingly, the hypothesis is:

Hypothesis 6 (H6): Business strategy significantly affects the financial performance of MSMEs in North Sumatra through the adoption of accounting information systems.

7. Structural Capital Readiness and Financial Performance of MSMEs through the Adoption of AIS

Structural capital readiness plays a critical role in enhancing the financial performance of MSMEs through the adoption of accounting information systems. According to the Resource-Based View (RBV), intellectual capital—such as organizational knowledge, experience, and technological infrastructure—forms a sustainable basis for addressing business challenges (Barney & Clark, 2007). AIS adoption becomes vital as it allows MSMEs to effectively manage and leverage financial data, thereby improving strategic decision-making and

long-term financial sustainability.

From the lens of Information Economics Theory, high-quality AIS can minimize information asymmetry within organizations, enhance operational efficiency, and improve the accuracy of financial reporting (Kimani, 2024). Thus, AIS should be seen not just as a technological tool but as a strategic asset that enhances MSMEs' responsiveness to a rapidly changing business environment.

Empirical studies support the notion that structural capital—such as robust IT infrastructure and efficient organizational structures—facilitates the successful implementation of AIS. Research by Daat et al. (2021) indicates that MSMEs with well-developed structural capital are more likely to have structured business processes, which supports AIS integration to produce accurate and relevant financial data. Similarly, studies by Shahzad et al. (2012) and Hejazi et al. (2016) affirm that firms with strong structural capital can better leverage IT to improve financial performance.

Therefore, strengthening structural capital through investments in intellectual assets and technological infrastructure can significantly enhance MSME financial performance via AIS adoption. Beyond improving internal processes and operational efficiency, AIS integration extends MSMEs' capabilities for timely and data-driven decision-making in complex business environments. This informs the following hypothesis:

Hypothesis 7 (H7): Structural capital readiness significantly affects the financial performance of MSMEs in North Sumatra through the adoption of accounting information systems.

RESEARCH METHODS AND MATERIALS

1. Research Design

This study adopts an explanatory research design**,** which is employed to explain causal relationships among the variables under investigation (Ghanad, 2023). A research design serves as a blueprint that outlines the plan, structure, and strategy for conducting the investigation to obtain answers to research questions or problems. It encompasses a comprehensive framework—from hypothesis formulation, operational implications, to the final data analysis phase. As Sileyew (2019) emphasized, a well-structured research design ensures the integrity and coherence of data collection, measurement, and analysis procedures.

Specifically, this research employs a causal associative method (Tilden & Snowden, 2018), which aims to examine cause-and-effect relationships between independent variables (digital transformation**,** business strategy, and structural capital readiness) and a dependent variable (financial performance of MSMEs), with the accounting information system serving as a mediating variable. The study seeks to understand the mechanisms through which digital transformation, strategic orientation, and structural capital readiness can influence the financial outcomes of MSMEs through the adoption of accounting information systems.

2. Operational Definition and Variable Measurement

Operational definitions are essential to ensure clarity and consistency in interpreting and measuring variables across the study. This research investigates the influence of digital transformation, business strategy, and structural capital readiness on the financial performance of MSMEs in North Sumatra, with accounting information systems as an intervening variable.

Table 1: Operational Definitions of Research Variables

No	Variable	Operational Definition	Measurement Indicators
1	Financial Performance	A critical measure used to evaluate the financial health and capability of an organization. For MSMEs, this refers to financial results derived from business operations (Gyamera et al., 2023).	Financial Activity Financial Process Financial Organization (Tuffour et al., 2022)
2	Digital Transformation	The broad and deep adoption of digital technologies by MSMEs to improve operational efficiency, expand market reach,	Information Technology Computing Communication

		and enhance value creation (Martínez-Caro et al., 2020).	Connectivity (Mangifera & Mawardi, 2022)
3	Business Strategy	The planned actions and decisions taken by MSMEs to achieve competitive advantage and business growth (Kim & Ha, 2023).	Finance Source Administrative Innovation Organizational Culture Development Capabilities of SMEs Information Source Business Manager Development Technological Innovation (Kareem et al., 2024)
4	Structural Capital Readiness	A component of intellectual capital that refers to non-human assets within MSMEs, aimed at improving operational efficiency, accelerating decision-making, and fostering innovation (Daat et al., 2021).	Databases Organizational Structure Process Guidelines Strategies Routines Software and Hardware (Daat et al., 2021)
5	Accounting Information System (AIS)	The infrastructure used by organizations to collect, store, process, and present accounting data necessary for managerial decision-making (Koundal et al., 2024).	People Procedures and Instructions Data Software IT Infrastructure Internal Controls (Elsharif, 2019)

3. Population, Sample, and Sampling Technique

The population in this study comprises Micro, Small, and Medium Enterprises (MSMEs) in North Sumatra, one of the provinces with the largest number of MSMEs in Indonesia, totaling 595,779 units (Ministry of Cooperatives and SMEs, Republic of Indonesia, 2024).

To determine the sample size, the study applies the Isaac and Michael formula, which is suitable for large population-based samples and considers specific confidence levels and margins of error:

$$n = \frac{\boldsymbol{\lambda^2 NP\,(1-P)}}{\boldsymbol{d^2(N-1)+\lambda^2 P(1-P)}}$$

Where:

$\boldsymbol{\lambda}^2$ = Chi-square value at 5% significance level = 3.841

N = Population size

P = Probability of success (0,5)

d = Margin of error (e.g., 0.01; 0.05; or 0.10)

Based on the calculation, the sample size for this study is determined to be 409 MSME respondents from North Sumatra.

4. Data Analysis Technique

This study employs a multivariate analysis approach using Partial Least Squares Structural Equation Modeling (PLS-SEM), as recommended by Hair et al. (2022). PLS-SEM is a variance-based SEM technique that is particularly suitable for research involving complex relationships among multiple variables. SmartPLS 4.0 software was utilized to test and measure the relationships between exogenous and endogenous latent variables.

a. Measurement Model Assessment (Outer Model)

The outer model specifies the relationships between latent constructs and their respective observed indicators,

focusing on the measurement theory underlying construct validity and reliability. According to Hair et al. (2022), the outer model is evaluated using the following criteria:

Evaluation	Criteria
Convergent Validity (Outer Loadings)	Outer Loadings ≥ 0.70
Average Variance Extracted (AVE)	AVE ≥ 0.50
Discriminant Validity	Cross-loading > 0.70; AVE of a construct should exceed its correlation with other constructs
Reliability	Cronbach's Alpha ≥ 0.60; Composite Reliability ≥ 0.70

These tests ensure that each construct is accurately represented by its indicators and is distinct from other constructs in the model.

b. Structural Model Assessment (Inner Model)

The inner model reflects the hypothesized relationships among latent constructs and is evaluated based on several key indacators:

Evaluation	Criteria
Coefficient of Determination (R^2)	Substantial (≥ 0.67), Moderate (≥ 0.33), Weak (≥ 0.19)
Effect Size (f^2)	Larger f^2 values indicate stronger predictor effects
Predictive Relevance (Q^2)	Q^2 values approaching 1 indicate strong predictive accuracy

The model's structural paths are assessed using bootstrapping procedures with 5,000 resamples to evaluate the t-statistics and p-values of each path coefficient, confirming their statistical significance.

c. Structural Equation Modeling Using PLS-SEM

PLS-SEM is a robust analytical technique that enables simultaneous analysis of measurement and structural models. It is particularly effective in exploratory studies, where the research model includes latent constructs measured by multiple indicators, especially with small sample sizes and non-normal data distribution.

The SEM-PLS model in this study consists of two main components:

1. Measurement Model – Specifies the relationships between latent variables and their manifest indicators.
2. Structural Model – Represents the hypothesized relationships among the latent variables.

PLS-SEM is also capable of identifying both direct and indirect effects, making it ideal for testing mediation hypotheses. Moreover, this method handles multicollinearity among predictors efficiently, producing reliable and accurate estimates of the strength and direction of relationships.

The structural model in this study is represented by the following equation:

$$KUMK = b_1\ TD + b_2\ SB + b_3\ SC + b_4\ SIA + b_5\ Z_1\ (TD \rightarrow SIA) + b_6\ Z_2\ (SB \rightarrow SIA) + b_7\ Z_3\ (SC \rightarrow SIA) + e \quad \ldots\ldots\ldots\ldots (1)$$

Where:

DT = Digital Transformation
BS = Business Strategy
SC = Structural Capital
AIS = Accounting Information System (mediator)
FP = Financial Performance

RESULTS AND DISCUSSION

1. Outer Model Testing

After collecting the questionnaires, the researcher performed further analysis using Structural Equation Modeling (SEM). The data analysis employed the Partial Least Squares (PLS) approach, beginning with the outer model testing.

a. Convergent Validity Testing

The results of Convergent Validity Testing with the loading factor test in this study are presented in the table below:

Table 2. Loading Factor Test Results

Construct	Indicator	Loading Factor	Critical Value	Conclusion
Digital Transformation (X1)	X1.1	0.834	0.7	Valid
	X1.2	0.905	0.7	Valid
	X1.3	0.942	0.7	Valid
	X1.4	0.876	0.7	Valid
	X1.5	0.773	0.7	Valid
	X1.6	0.848	0.7	Valid
	X1.7	0.862	0.7	Valid
	X1.8	0.726	0.7	Valid
	X1.9	0.782	0.7	Valid
	X1.10	0.840	0.7	Valid
	X1.11	0.806	0.7	Valid
	X1.12	0.844	0.7	Valid
Business Strategy (X2)	X2.1	0.850	0.7	Valid
	X2.2	0.840	0.7	Valid
	X2.3	0.838	0.7	Valid
	X2.4	0.931	0.7	Valid
	X2.5	0.942	0.7	Valid
	X2.6	0.657	0.7	Invalid
	X2.7	0.900	0.7	Valid
	X2.8	0.908	0.7	Valid
	X2.9	0.886	0.7	Valid
	X2.10	0.870	0.7	Valid
	X2.11	0.890	0.7	Valid
	X2.12	0.866	0.7	Valid
	X2.13	0.938	0.7	Valid
	X2.14	0.966	0.7	Valid
	X2.15	0.883	0.7	Valid
	X2.16	0.961	0.7	Valid
	X2.17	0.956	0.7	Valid
	X2.18	0.910	0.7	Valid
	X2.19	0.909	0.7	Valid
	X2.20	0.928	0.7	Valid
	X2.21	0.973	0.7	Valid
Structural Capital (X3)	X3.1	0.867	0.7	Valid
	X3.2	0.817	0.7	Valid
	X3.3	0.801	0.7	Valid
	X3.4	0.926	0.7	Valid
	X3.5	0.819	0.7	Valid
	X3.6	0.935	0.7	Valid
	X3.7	0.932	0.7	Valid
	X3.8	0.890	0.7	Valid
	X3.9	0.896	0.7	Valid
	X3.10	0.850	0.7	Valid
	X3.11	0.888	0.7	Valid

Construct	Indicator	Loading Factor	Critical Value	Conclusion
	X3.12	0.952	0.7	Valid
	X3.13	0.873	0.7	Valid
	X3.14	0.954	0.7	Valid
	X3.15	0.846	0.7	Valid
	X3.16	0.904	0.7	Valid
	X3.17	0.871	0.7	Valid
	X3.18	0.852	0.7	Valid
	Y1	0.926	0.7	Valid
	Y2	0.885	0.7	Valid
	Y3	0.894	0.7	Valid
Financial Performance of MSMEs (Y)	Y4	0.887	0.7	Valid
	Y5	0.906	0.7	Valid
	Y6	0.936	0.7	Valid
	Y7	0.888	0.7	Valid
	Y8	0.904	0.7	Valid
	Y9	0.767	0.7	Valid
	Z1	0.914	0.7	Valid
	Z2	0.824	0.7	Valid
	Z3	0.938	0.7	Valid
	Z4	0.907	0.7	Valid
	Z5	0.887	0.7	Valid
	Z6	0.874	0.7	Valid
	Z7	0.806	0.7	Valid
	Z8	0.776	0.7	Valid
Accounting Information System (Z)	Z9	0.848	0.7	Valid
	Z10	0.914	0.7	Valid
	Z11	0.919	0.7	Valid
	Z12	0.934	0.7	Valid
	Z13	0.950	0.7	Valid
	Z14	0.912	0.7	Valid
	Z15	0.862	0.7	Valid
	Z16	0.859	0.7	Valid
	Z17	0.909	0.7	Valid
	Z18	0.957	0.7	Valid

The loading factor test results for each indicator have met the validity standards, as all values exceed the critical threshold of 0.7. Consequently, the valid indicators are deemed suitable for the subsequent tests.

b. Results of the Average Variance Extracted (AVE) Test

The results of the AVE test in this study are presented in the table below:

Table 3. AVE Test Results

Variable	AVE	Critical Value	Conclusion
TD (X1)	0.737	0.5	Reliable
SB (X2)	0.802	0.5	Reliable
SC (X3)	0.859	0.5	Reliable
SIA (Z)	0.746	0.5	Reliable
KUMK (Y)	0.849	0.5	Reliable

The AVE test results indicate that all variables exhibit AVE values exceeding the critical threshold of 0.5. This confirms that the variables are valid and reliable for further analysis.

c. Discriminant Validity Testing

The following table displays the results of the cross loading test conducted in this study:

Table 4. Cross Loading Test Results

Construct	Indicators	X1	X2	X3	Y	Z	Critical Point	Result
Digital Transformation (X1)	X1.1	0.828	0.518	0.432	0.567	0.561	0.7	Good
	X1.2	0.797	0.463	0.381	0.523	0.485	0.7	Good
	X1.3	0.798	0.456	0.418	0.523	0.486	0.7	Good
	X1.4	0.830	0.489	0.403	0.544	0.516	0.7	Good
	X1.5	0.856	0.475	0.386	0.514	0.495	0.7	Good
	X1.6	0.869	0.532	0.436	0.576	0.536	0.7	Good
	X1.7	0.896	0.541	0.407	0.605	0.573	0.7	Good
	X1.8	0.847	0.524	0.428	0.591	0.522	0.7	Good
	X1.9	0.873	0.559	0.473	0.566	0.576	0.7	Good
	X1.10	0.903	0.591	0.476	0.616	0.602	0.7	Good
	X1.11	0.883	0.568	0.458	0.584	0.593	0.7	Good
	X1.12	0.909	0.594	0.459	0.581	0.594	0.7	Good
Business Strategy (X2)	X2.1	0.577	0.855	0.443	0.581	0.595	0.7	Good
	X2.2	0.561	0.886	0.458	0.613	0.614	0.7	Good
	X2.3	0.574	0.911	0.476	0.621	0.593	0.7	Good
	X2.4	0.532	0.816	0.377	0.514	0.494	0.7	Good
	X2.5	0.533	0.864	0.440	0.582	0.568	0.7	Good
	X2.6	0.560	0.905	0.468	0.585	0.578	0.7	Good
	X2.7	0.572	0.925	0.467	0.604	0.596	0.7	Good
	X2.8	0.525	0.895	0.461	0.592	0.562	0.7	Good
	X2.9	0.536	0.881	0.488	0.598	0.584	0.7	Good
	X2.10	0.547	0.917	0.510	0.640	0.619	0.7	Good
	X2.11	0.550	0.915	0.491	0.641	0.645	0.7	Good
	X2.12	0.536	0.882	0.471	0.617	0.611	0.7	Good
	X2.13	0.545	0.923	0.493	0.634	0.649	0.7	Good
	X2.14	0.575	0.911	0.457	0.626	0.635	0.7	Good
	X2.15	0.513	0.893	0.447	0.593	0.635	0.7	Good
	X2.16	0.542	0.925	0.477	0.623	0.653	0.7	Good
	X2.17	0.534	0.855	0.454	0.573	0.610	0.7	Good
	X2.18	0.574	0.934	0.470	0.630	0.669	0.7	Good
	X2.19	0.534	0.867	0.467	0.598	0.611	0.7	Good
	X2.20	0.567	0.910	0.446	0.611	0.665	0.7	Good
	X2.21	0.560	0.922	0.466	0.606	0.651	0.7	Good
Structural Capital (X3)	X3.1	0.443	0.480	0.887	0.562	0.594	0.7	Good
	X3.2	0.454	0.457	0.901	0.596	0.526	0.7	Good
	X3.3	0.463	0.503	0.923	0.589	0.589	0.7	Good
	X3.4	0.464	0.494	0.919	0.577	0.583	0.7	Good
	X3.5	0.471	0.514	0.941	0.607	0.603	0.7	Good
	X3.6	0.456	0.490	0.921	0.578	0.566	0.7	Good
	X3.7	0.457	0.485	0.917	0.594	0.545	0.7	Good
	X3.8	0.458	0.469	0.935	0.623	0.542	0.7	Good

Construct	Indicators	X1	X2	X3	Y	Z	Critical Point	Result
	X3.9	0.478	0.483	0.940	0.618	0.543	0.7	Good
	X3.10	0.465	0.458	0.936	0.626	0.523	0.7	Good
	X3.11	0.475	0.461	0.933	0.633	0.533	0.7	Good
	X3.12	0.461	0.474	0.940	0.641	0.541	0.7	Good
	X3.13	0.462	0.505	0.923	0.592	0.587	0.7	Good
	X3.14	0.467	0.491	0.917	0.574	0.581	0.7	Good
	X3.15	0.477	0.484	0.940	0.618	0.542	0.7	Good
	X3.16	0.464	0.457	0.936	0.624	0.520	0.7	Good
	X3.17	0.478	0.461	0.930	0.630	0.533	0.7	Good
	X3.18	0.469	0.473	0.939	0.640	0.539	0.7	Good
	Y1	0.561	0.605	0.504	0.869	0.637	0.7	Good
	Y2	0.550	0.605	0.515	0.881	0.626	0.7	Good
	Y3	0.602	0.633	0.593	0.931	0.689	0.7	Good
Financial Performance of	Y4	0.596	0.638	0.575	0.917	0.708	0.7	Good
MSMEs (Y)	Y5	0.597	0.654	0.571	0.935	0.698	0.7	Good
	Y6	0.612	0.664	0.564	0.955	0.715	0.7	Good
	Y7	0.578	0.606	0.535	0.923	0.684	0.7	Good
	Y8	0.595	0.649	0.575	0.952	0.713	0.7	Good
	Y9	0.582	0.611	0.528	0.925	0.686	0.7	Good
	Z1	0.598	0.613	0.664	0.683	0.887	0.7	Good
	Z2	0.541	0.545	0.613	0.629	0.869	0.7	Good
	Z3	0.570	0.552	0.611	0.641	0.875	0.7	Good
	Z4	0.513	0.516	0.604	0.571	0.819	0.7	Good
	Z5	0.577	0.606	0.636	0.655	0.895	0.7	Good
	Z6	0.565	0.592	0.558	0.663	0.879	0.7	Good
	Z7	0.607	0.636	0.581	0.684	0.906	0.7	Good
	Z8	0.623	0.635	0.552	0.671	0.891	0.7	Good
Accounting Information System (Z)	Z9	0.590	0.623	0.574	0.692	0.914	0.7	Good
	Z10	0.607	0.620	0.608	0.711	0.912	0.7	Good
	Z11	0.614	0.642	0.612	0.704	0.921	0.7	Good
	Z12	0.561	0.584	0.599	0.648	0.883	0.7	Good
	Z13	0.545	0.559	0.509	0.608	0.842	0.7	Good
	Z14	0.484	0.470	0.431	0.493	0.745	0.7	Good
	Z15	0.486	0.484	0.407	0.533	0.760	0.7	Good
	Z16	0.626	0.630	0.514	0.679	0.852	0.7	Good
	Z17	0.570	0.585	0.535	0.606	0.849	0.7	Good
	Z18	0.563	0.574	0.535	0.639	0.822	0.7	Good

The results of the cross-loading test demonstrate that all indicators exhibit high cross loading coefficients for their respective constructs, and have met the validity standards as per the critical value of 0.7. These results indicate that the discriminant validity of this study is well-established.

The results of the Fornell-Larcker correlation test in this study are presented in the following table:

Table 5. Results of the Fornell-Larcker Correlation Test

Variable	TD (X1)	SB (X2)	SC (X3)	SIA (Z)	KUMK (Y)
TD (X1)	0.858	0.614	0.501	0.660	0.636
SB (X2)	0.614	0.895	0.518	0.675	0.683

SC (X3)	0.501	0.518	0.927	0.655	0.599
SIA (Z)	0.858	0.614	0.501	0.660	0.636
KUMK (Y)	0.614	0.895	0.518	0.675	0.683

The results of the Fornell-Larcker correlation test show that the diagonal values of the financial performance variable (KUMK) exceed the correlation values between these variable and other latent variables. This indicates that the correlation value of each latent variable with itself is greater than its correlation with other latent variables, confirming that each latent variable possesses adequate discriminant validity.

d. Reliability Testing

The results of the Cronbach's Alpha test in this study are presented in the following table:

Table 6. Results of the Cronbach's Alpha Test

Variable	Cronbach's Alpha	Critical Value	Conclusion
Financial Performance	0.967	0.6	Reliable
Accounting Information System	0.984	0.6	Reliable
Business Strategy	0.988	0.6	Reliable
Structural Capital	0.983	0.6	Reliable
Digital Transformation	0.961	0.6	Reliable

The results of the Cronbach's Alpha test indicate that all variables meet the standard Cronbach's Alpha threshold, which is above 0.6. This demonstrates a good level of reliability and dependability in measuring the inner model.

The results of the Composite Reliability test in this study are shown in the following table:

Table 7. Results of the Composite Reliability Test

Variable	Composite Reliability	Critical Value	Conclusion
Financial Performance	0.970	0.7	Reliable
Accounting Information System	0.985	0.7	Reliable
Business Strategy	0.989	0.7	Reliable
Structural Capital	0.985	0.7	Reliable
Digital Transformation	0.965	0.7	Reliable

The results of the Composite Reliability test show that all variables exceed the 0.7 threshold, indicating good reliability and dependability for measuring the inner model.

2. Inner Model Testing

a. Coefficient of Determination (R^2)

The results of the Coefficient of Determination (R^2) test in this study are presented in the following table:

Table 8. Results of the Coefficient of Determination (R^2) Test

Construct	Variable	R-Square Value	Criterion
Financial Performance of MSMEs (Y)	Digital Transformation (X1) Business Strategy (X2) Structural Capital (X3) Accounting Information System (Z) Z1 Z2 Z3	0,446527778	Moderate

The Coefficient of Determination test results reveal that the variation in the Digital Transformation (X1), Business Strategy (X2), Structural Capital (X3), and Accounting Information System (Z) model explains 64.3% of the Financial Performance of MSMEs (Y). This R^2 value indicates a moderate level and can predict the financial performance of MSMEs in North Sumatra.

b. Effect Size (f^2) Testing

The results of the effect size (f^2) test in this study are presented in the following table:

Table 9. Results of the Effect Size (f^2) Test

Construct	Variable	f-Square Value	Criterion
Financial Performance of MSMEs (Y)	Digital Transformation (X1)	0.106	Small
	Business Strategy (X2)	0.164	Moderate
	Structural Capital (X3)	0.091	Small
	Accounting Information System (Z)	0.283	Moderate
	X1 → Z	0.071	Small
	X2 → Z	0.080	Small
	X3 → Z	0.080	Small

The effect size (f^2) test results indicate the relative influence of each variable on the financial performance of MSMEs. Digital Transformation (X1) and Structural Capital (X3) have small effect sizes, with values of 0.106 and 0.091, respectively, indicating a minor influence on the financial performance of MSMEs. Business Strategy (X2) and Accounting Information System (Z) exhibit stronger effects, with f^2 values of 0.164 and 0.283, respectively, falling within the moderate category, highlighting their significant roles in influencing the financial performance of MSMEs. Additionally, the relationships between Digital Transformation (X1), Business Strategy (X2), and Structural Capital (X3) through the adoption of Accounting Information Systems (Z) all fall within the small effect size category, with f^2 values of 0.071, 0.080, and 0.080, respectively.

c. Predictive Relevance (Q^2) Testing

The results of the Predictive Relevance (Q^2) test in this study are shown in the following table:

Table 10. Results of the Predictive Relevance (Q^2) Test

Construct	Variable	Q-Square Value	Conclusion
Financial Performance of MSMEs (Y)	Digital Transformation (X1) Business Strategy (X2) Structural Capital (X3) Accounting Information System (Z) X1 → Z X2 → Z X3 → Z	0,645	Has Predictive Relevance

The results of the Predictive Relevance (Q^2) test show that Digital Transformation, Business Strategy, Structural Capital, and Accounting Information Systems have a Q^2 value of 0.645, indicating that Digital Transformation has a predictive relevance of 64.5% with respect to the financial performance of MSMEs. This suggests that Digital Transformation, Business Strategy, Structural Capital, and Accounting Information Systems significantly predict changes or variations in the financial performance of MSMEs, underlining their essential role in enhancing financial performance.

3. Hypothesis Testing

The results of the hypothesis testing in this study are presented in the table below:

Table 11. Hypothesis Test Results

Hypothesis	Path Coefficient	P-Values
X1 → Y	0.162	<0.001

X2 → Y	0.239	<0.001
X3 → Y	0.152	<0.001
Z → Y	0.375	<0.001
X1 → Z → Y	0.109	<0.001
X2 → Z → Y	0.117	<0.001
X3 → Z → Y	0.134	<0.001

The results of hypothesis testing in this study indicate that digital transformation (X1), business strategy (X2), and structural capital readiness (X3) have a significant direct impact on the financial performance of MSMEs in North Sumatra, as evidenced by p-values < 0.001, which are smaller than the 5% significance level. Additionally, the adoption of accounting information systems (Z) has also been shown to significantly affect the financial performance of MSMEs. Furthermore, this study finds that the adoption of accounting information systems mediates the relationship between digital transformation, business strategy, structural capital readiness, and the financial performance of MSMEs. Therefore, the implementation of digital transformation, the strengthening of business strategies, and the readiness of structural capital, supported by the optimal use of accounting information systems, are key factors in improving the financial performance of MSMEs in North Sumatra.

4. SEM-PLS Structural Model

The SEM-PLS structural model used in this study is illustrated in the figure below:

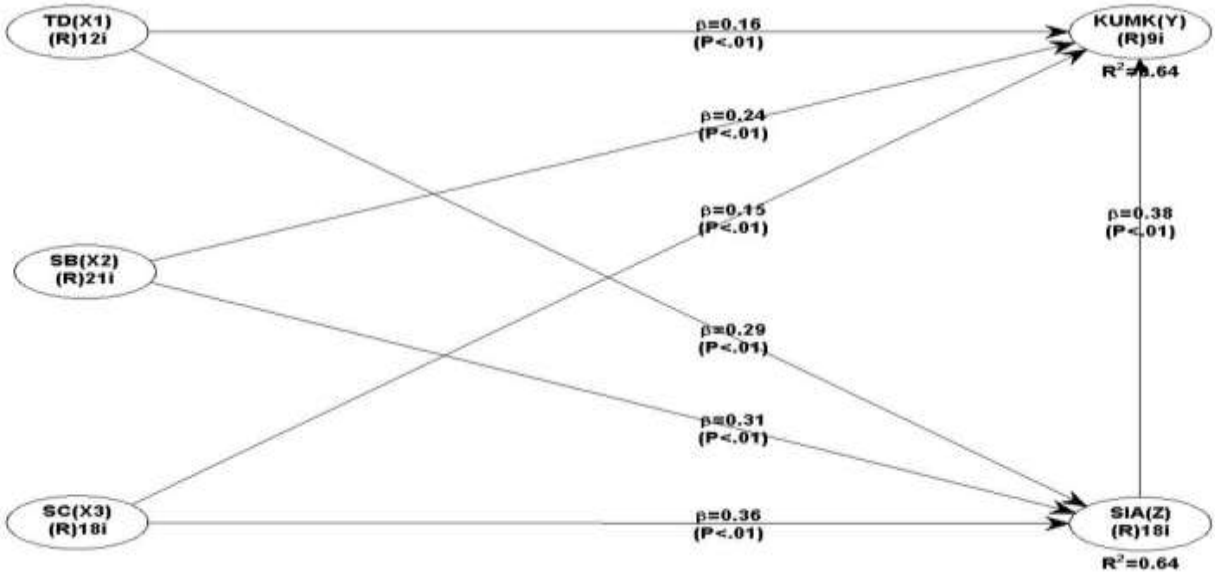

Figure 1. SEM-PLS Structural Model

Based on the results of the SEM-PLS structural model in this study, the following structural equations are derived:

KUMK = b_1TD + b_2SB + b_3SC + b_4SIA + b_5Z1 (TD→SIA) + b_6Z1 (SC→SIA) + b_7Z1 (SB→SIA) + e

KUMK = 0.162TD + 0.239SB + 0.152SC + 0.375SIA + 0.109Z1 (TD→SIA) + 0.117Z1 (SC→SIA) + 0.134Z1 (SB→SIA) + e

The findings from the structural model can be summarized as follows:

1. The structural model for the digital transformation variable (TD) shows a positive path coefficient of 0.162. This indicates that a one-unit increase in digital transformation will lead to a 0.162-unit improvement in the financial performance of MSMEs in North Sumatra.

2. The structural model for the business strategy variable (SB) reveals a positive path coefficient of 0.239. This means that a one-unit increase in business strategy will result in a 0.239-unit increase in the financial performance of MSMEs in North Sumatra.
3. The structural model for the structural capital readiness variable (SC) shows a positive path coefficient of 0.152. This indicates that a one-unit increase in structural capital readiness will lead to a 0.152-unit improvement in the financial performance of MSMEs in North Sumatra.
4. The structural model for the accounting information systems variable (SIA) shows a positive path coefficient of 0.375. This implies that a one-unit increase in the adoption of accounting information systems will result in a 0.375-unit improvement in the financial performance of MSMEs in North Sumatra.
5. The structural model for digital transformation through the adoption of accounting information systems shows a positive path coefficient of 0.109. This means that a one-unit increase in digital transformation, which encourages the use of accounting information systems, will enhance the financial performance of MSMEs by 0.109 units.
6. The structural model for business strategy through the adoption of accounting information systems shows a positive path coefficient of 0.117. This indicates that a one-unit increase in business strategy, which drives the use of accounting information systems, will result in a 0.117-unit improvement in the financial performance of MSMEs.
7. The structural model for structural capital readiness through the adoption of accounting information systems shows a positive path coefficient of 0.134. This suggests that a one-unit increase in structural capital readiness, which encourages the use of accounting information systems, will lead to a 0.134-unit improvement in the financial performance of MSMEs in North Sumatra.

CONCLUSIONS

This study, employing Structural Equation Modeling-Partial Least Squares (SEM-PLS) and cluster analysis, provides valuable insights into the relationship between digital transformation, business strategy, structural capital readiness, and the financial performance of Micro, Small, and Medium Enterprises (MSMEs) in North Sumatra. The findings demonstrate that digital transformation, business strategy, and structural capital readiness significantly influence the financial performance of MSMEs, both directly and indirectly through the adoption of accounting information systems.

Digital transformation has been shown to significantly enhance financial performance by improving operational efficiency and enabling better access to financial data. These advancements support the competitiveness and long-term sustainability of MSMEs in an increasingly digitized business environment. Similarly, a well-designed business strategy contributes positively to financial performance by directing organizational resources toward financial goals in a more efficient and goal-oriented manner. Structural capital readiness—reflected in the strength of organizational infrastructure and internal systems—also plays a vital role in supporting MSMEs' financial outcomes by facilitating the implementation of robust, efficient systems and processes.

The study further reveals that accounting information systems have a direct and significant impact on financial performance. Their adoption improves the accuracy, transparency, and efficiency of financial data management, which in turn enhances the quality of decision-making processes. Moreover, the adoption of accounting information systems serves as a crucial mediating variable, amplifying the positive effects of digital transformation, business strategy, and structural capital readiness on financial performance. The integration of digital technologies with accounting systems positions technology as a key enabler of financial optimization. Business strategies that are supported by digital accounting tools allow for more data-driven and strategic decision-making. Additionally, the alignment of structural capital readiness with technological systems leads to improved financial management, reinforcing the operational success and overall performance of MSMEs.

From a practical standpoint, the results suggest that MSMEs in North Sumatra must focus on strengthening their technological capabilities, formulating cohesive and adaptive business strategies, and enhancing

structural capital readiness to optimize their financial performance in the era of digital transformation. The effective implementation of accounting information systems plays a critical role in this process by facilitating more accurate record-keeping, expediting decision-making, and improving operational efficiency. However, the adoption and utilization of these systems are often constrained by limited resources, underlining the need for active support from key stakeholders such as government agencies, technology providers, and financial institutions.

Furthermore, the strategic mapping conducted in this study highlights that the integration of accounting information systems—when complemented by appropriate business strategies and a high level of structural capital readiness—is essential for improving financial performance. These findings underscore the importance of investing in the digital upskilling of employees, reinforcing accounting and financial systems, and establishing strategic partnerships with stakeholders. Such efforts are vital to overcoming persistent challenges in technology access and financial support, and ultimately, to ensuring that MSMEs in North Sumatra are well-positioned to thrive in the digital economy.

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