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The Impact of E-Commerce and Accounting Information Systems on Entrepreneurial Decision-Making in MSMEs: A Quantitative Study in the Digital Era

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Abstract

This study investigates the influence of e-commerce and accounting information systems (AIS) on entrepreneurial decision-making among Micro, Small, and Medium Enterprises (MSMEs) in the digital era. Using a quantitative research approach, the study employs multiple linear regression analysis to examine the extent to which these technologies enhance data-driven decision-making. The findings reveal a significant positive relationship between e-commerce and AIS and the quality of decisions made by MSME operators. E-commerce provides real-time market insights, enabling faster responses to consumer trends, while AIS enhances financial accuracy and strategic planning by integrating financial data. Statistical analysis demonstrates that e-commerce and AIS collectively explain 66% of the variance in decision-making quality, with e-commerce contributing a regression coefficient of 0.45 and AIS at 0.55, both significant at $p < 0.05$. These technologies have enabled MSMEs to improve operational efficiency, respond promptly to market demands, and make more informed strategic decisions. However, barriers such as limited financial resources, technical expertise, and data security concerns pose challenges to broader adoption. The study emphasizes the necessity for government and institutional support in providing training and financial incentives to facilitate technology adoption among MSMEs. The findings contribute to the growing literature on digital transformation in business, highlighting the critical role of technology integration in enhancing decision-making processes in the MSME sector.

Keywords: *E-Commerce, Accounting Information Systems, Entrepreneurial Decision-Making, Micro, Small, and Medium Enterprises (MSMEs), Digital Transformation*
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I. INTRODUCTION

The rapid digital transformation has revolutionized business operations worldwide, especially for Micro, Small, and Medium Enterprises (MSMEs). These enterprises are now increasingly dependent on digital technologies to remain competitive, enhance operational efficiency, and expand market reach. Traditional methods of decision-making, relying on intuition or manual record-keeping, are no longer sufficient in a data-driven business environment. Technologies such as e-commerce platforms and accounting information systems (AIS) provide MSMEs with critical tools to integrate real-time market insights and accurate financial data into their strategic planning processes.

MSMEs constitute over 90% of all enterprises globally and significantly contribute to employment and economic growth. Despite their importance, digital adoption among MSMEs

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remains uneven, particularly in emerging economies. For instance, in Thailand, more than 40% of MSMEs face challenges in sustaining e-commerce adoption due to infrastructural and managerial barriers (Amornkitvikai et al., 2022). In Indonesia, only about 30% of MSMEs have fully implemented AIS, showing that financial data management largely remains manual (Li, 2022). Security concerns and limited technical expertise further restrict adoption, highlighting the need for supportive policies and capacity-building initiatives (Jia et al., 2022). This context underscores the necessity of examining the integrated role of e-commerce and AIS in enhancing MSME decision-making.

Previous research has explored e-commerce adoption for market expansion, customer engagement, and global trade participation. E-commerce platforms facilitate real-time interactions, streamline supply chain processes, and optimize transaction efficiency (Costa & Rodrigues, 2024; Kumari & Ahmed, 2022) and (Binsaif, 2022). Social commerce, leveraging social media tools, further enhances consumer engagement and brand visibility (Adewusi et al., 2024). Meanwhile, AIS adoption strengthens financial accuracy, improves internal audits, and supports sustainable decision-making in small businesses. Research also shows that big data analytics and business intelligence provide additional support for informed decision-making (Gopal et al., 2024). These studies indicate the individual benefits of e-commerce and AIS, yet the literature remains limited on their combined impact.

Although e-commerce and AIS have been widely studied independently, there is a lack of comprehensive studies investigating their combined effect on entrepreneurial decision-making in MSMEs. Most existing works focus on either operational efficiency, financial reporting, or technology adoption barriers without examining their synergies (Chin et al., 2023). Additionally, research largely originates from developed economies, leaving a knowledge gap in emerging markets where MSMEs face unique challenges such as limited resources, cybersecurity threats, and infrastructural constraints (Falahat et al., 2023) and (Hoang & Bui, 2023). This gap justifies an empirical study exploring how e-commerce and AIS collectively influence decision quality among MSMEs in digital-era contexts.

The objective of this study is to quantitatively examine the impact of e-commerce and AIS on entrepreneurial decision-making in MSMEs. This research contributes by generating empirical evidence on how the integration of digital technologies improves decision quality and highlights key barriers to their effective adoption. Furthermore, the study informs policy recommendations by emphasizing the importance of capacity-building and technological support to strengthen MSME competitiveness. Lastly, it enriches the literature on digital transformation in emerging

economies while offering practical insights for both practitioners and policymakers on leveraging technology for sustainable MSME growth.

II. LITERATURE REVIEW

A. Digital Transformation and Decision-Making in MSMEs

The rapid advancement of digital technology has fundamentally transformed business operations, creating both unprecedented opportunities and complex challenges for Micro, Small, and Medium Enterprises (MSMEs). These enterprises increasingly rely on digital technologies to maintain competitiveness and enhance operational efficiency within increasingly dynamic and globalized market environments (Pua, 2023). The crucial shift from traditional intuition-based decision-making to data-driven approaches has become essential for MSMEs seeking to expand their market reach and improve strategic responsiveness to rapidly changing consumer demands and competitive pressures (Reddy & Nalla, 2024). This digital transformation journey requires MSMEs to develop new capabilities and adapt their business models to leverage technological innovations effectively while managing associated risks and implementation challenges.

The sociotechnical perspective provides a comprehensive and valuable framework for understanding how digital technologies influence entrepreneurial decision-making processes in MSME contexts. This approach emphasizes that technological systems are not neutral tools but are designed, implemented, and interpreted within specific social, cultural, and organizational contexts (Semerádová & Weinlich, 2022). The integration of e-commerce platforms and accounting information systems represents a significant digital transformation that requires careful consideration of both technical capabilities and human factors, including user acceptance, psychological impact on decision-makers, and the organizational restructuring necessary for successful implementation (Schmidt et al., 2022). This perspective highlights that successful technology adoption depends on the harmonious integration of social and technical systems, where human expertise and technological capabilities complement rather than replace each other in the decision-making process.

B. E-Commerce Adoption and Market Intelligence

E-commerce platforms have emerged as indispensable tools for MSMEs to access real-time market intelligence and enhance customer engagement in the digital economy. These advanced platforms facilitate immediate and personalized interactions with consumers, streamline supply chain operations, and optimize transaction efficiency, thereby providing valuable data on evolving consumer behavior and emerging market trends (Rashid & Jaf, 2023). The sophisticated implementation of e-commerce enables MSMEs to monitor market dynamics continuously,

identify emerging opportunities through data analytics, and respond proactively to changing consumer preferences, thereby significantly enhancing their competitive positioning in increasingly crowded digital marketplaces (Lin & Wang, 2023). This technological capability transforms how MSMEs understand and interact with their markets, moving from reactive approaches to proactive, data-informed strategic positioning.

The governance and management of e-commerce platforms involve complex negotiations between technological capabilities, evolving regulatory requirements, and changing market expectations (Risberg, 2023). As MSMEs expand their digital presence across global markets, they encounter significant challenges in reconciling localized business practices, cultural preferences, and legal frameworks with standardized e-commerce operations and international trade regulations (Qi et al., 2024). The transparency and explainability of e-commerce algorithms and data processing systems significantly influence decision-making quality and consumer trust, as opaque or biased systems can obscure critical market information, distort competitive analysis, and ultimately erode confidence in digital platforms (Pascucci et al., 2023). These governance challenges require MSMEs to develop sophisticated digital literacy and regulatory compliance capabilities to navigate the complex e-commerce ecosystem successfully.

C. Accounting Information Systems and Financial Intelligence

Modern AIS play an increasingly vital role in enhancing financial intelligence and supporting evidence-based decision-making processes in MSMEs. These sophisticated systems provide structured financial data and advanced analytical capabilities that significantly improve accounting accuracy, facilitate comprehensive internal audits, and enhance regulatory compliance (Yang et al., 2022). However, algorithmic decision-making within AIS can sometimes reflect and amplify biases present in training data or system design, potentially leading to discriminatory outcomes in financial reporting, credit assessment, and strategic analysis (Yokeshwaran & Murugachandravel, 2022). This necessitates careful system design, continuous monitoring, and human oversight to ensure fair and equitable financial management practices.

The implementation of advanced AIS raises important questions about due process, accountability, and ethical considerations in automated financial decision-making (Rojas-Berrio et al., 2022). MSMEs often face practical challenges in appealing automated financial decisions, ensuring transparency in accounting processes, and maintaining human oversight over critical financial functions. Beyond mere technical functionality, the social and organizational implications of AIS adoption include significant impacts on accounting professionals, financial managers, and organizational culture (Thuan et al., 2022). The emotional strain, skill adaptation requirements, and change management challenges associated with AIS implementation highlight

the crucial human dimensions of technological transformation in financial management, requiring comprehensive support systems and continuous learning opportunities (Morić et al., 2024).

D. The Synergistic Effect: Integrating Digital Technologies

The strategic integration of e-commerce and AIS creates powerful synergistic effects that significantly enhance entrepreneurial decision-making beyond the capabilities of either system implemented in isolation (Lutfi et al., 2022). This integration enables MSMEs to combine real-time market intelligence from e-commerce platforms with deep financial insights from AIS, creating a comprehensive and holistic understanding of business performance and market position (Wang, 2024). The future of human-technology collaboration in MSME decision-making will likely focus on improving system explainability, enhancing algorithmic accountability, and increasing adaptability to changing business environments (Riwajanti, 2022). This evolutionary path recognizes that effective digital transformation requires both technological sophistication and human wisdom working in concert.

Emerging research suggests that collaborative interfaces, where digital technologies provide real-time recommendations while preserving human judgment and oversight in final decisions, offer particularly significant potential for MSME contexts (Kardiyati & Karim, 2023). This balanced approach aligns with the growing recognition that effective decision-making in MSMEs requires careful balancing of technological efficiency with human expertise, ethical considerations, and contextual understanding (Santos-Jaén et al., 2023). Based on this comprehensive theoretical framework, the current study proposes that the integration of e-commerce and AIS creates a synergistic effect that significantly enhances entrepreneurial decision-making quality in MSMEs by providing both market visibility and financial clarity. This integration allows MSMEs to make decisions that are not only data-informed but also contextually appropriate and strategically sound, leveraging the complementary strengths of both technological systems and human intelligence.

III. RESEARCH METHOD

A. Research Design

This study adopts a quantitative research design, as it seeks to measure and analyze the impact of e-commerce and AIS on entrepreneurial decision-making in MSMEs. A cross-sectional survey method is employed, allowing data to be collected at a single point in time to capture the influence of digital technologies on current business practices. This design emphasizes objectivity through the use of numerical data, which enables statistical testing of hypotheses and ensures replicability of the findings across similar contexts. By employing a quantitative approach, the study provides

empirical evidence of the extent to which technology adoption enhances decision-making quality among entrepreneurs, while minimizing potential biases associated with qualitative interpretation.

B. Population and Sample

The population of this study consists of MSMEs operating in Indonesia that have integrated e-commerce and Accounting Information Systems (AIS) into their operations. According to official reports from the Ministry of Cooperatives and SMEs, there are approximately 65.5 million MSMEs nationwide. A purposive sampling technique was employed to select 300 MSMEs from various sectors (retail, services, manufacturing), with specific inclusion criteria to ensure respondents possessed relevant experience: (1) Active use of e-commerce platforms (such as, Shopee, Tokopedia, Bukalapak) for at least one year; (2) Implementation of computerized accounting systems (such as, Accurate Online, Jurnal.io) for at least six months; (3) Classification as a micro, small, or medium enterprise based on official Indonesian government criteria (assets and revenue); and (4) Respondents must be owners or managers directly involved in strategic decision-making. These criteria ensure the collection of relevant and informed insights, enhancing the validity and generalizability of the findings within the digital economy context.

C. *Data Sources and Data Collection Techniques*

The primary source of data is derived from structured questionnaires distributed electronically to MSME owners and managers. The use of an online format enables efficient reach across geographically dispersed respondents while reducing logistical costs. The questionnaire is structured using Likert-scale items to measure perceptions of e-commerce usage, AIS effectiveness, and decision-making quality. In addition, secondary data are collected from government reports, industry statistics, and prior academic studies to complement the survey findings, while the entire data collection process is conducted over a two-month period to ensure comprehensive coverage and minimize seasonal biases in business activities.

D. Variables and Operational Definition

This study focuses on three key variables: e-commerce (independent variable 1), accounting information systems (independent variable 2), and entrepreneurial decision-making (dependent variable). E-commerce is operationalized as the degree to which MSMEs utilize digital platforms for online marketing, sales transactions, and customer relationship management. AIS is operationalized as the use of computer-based accounting tools and processes that facilitate recording, analyzing, and reporting financial information to support managerial and strategic decisions. Meanwhile, entrepreneurial decision-making is defined as the ability of MSME owners

or managers to make timely, accurate, and well-informed decisions in business operations, reflecting both operational efficiency and strategic foresight.

E. *Measurement Instruments and Validity/Reliability Testing*

The measurement instrument was a structured questionnaire developed from prior validated scales on digital adoption and decision-making, using a five-point Likert scale. Construct validity was assessed using Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA), which confirmed that all items adequately represented their intended constructs with factor loadings exceeding 0.60 and Average Variance Extracted (AVE) values above 0.50 for each construct. Reliability testing using Cronbach's alpha demonstrated strong internal consistency, with all values significantly exceeding the 0.70 threshold: e-commerce adoption ($\alpha = 0.87$), AIS adoption ($\alpha = 0.91$), and entrepreneurial decision-making quality ($\alpha = 0.89$). Additionally, composite reliability scores ranged from 0.85 to 0.92. These results confirm that the measurement instruments are both reliable and valid for measuring the studied constructs in the MSME context.

F. *Data Analysis Techniques*

The collected data are analyzed using multiple linear regression analysis to determine the influence of e-commerce and AIS on entrepreneurial decision-making. Prior to conducting regression analysis, preliminary data screening is undertaken to check for missing values, detect outliers, and verify assumptions of normality and multicollinearity. Descriptive statistics are also calculated to summarize the demographic and business characteristics of the respondents, while correlation analysis is used to examine relationships between variables. Hypotheses are tested at a 95% confidence level ($p < 0.05$), allowing the study to determine both the individual and combined effects of e-commerce and AIS on decision-making outcomes.

G. *Mathematical Formulas or Models*

In analyzing the relationship between e-commerce, accounting information systems, and entrepreneurial decision-making, it is essential to use a statistical model that can quantify the influence of multiple independent variables simultaneously. Multiple linear regression was selected because it allows researchers to examine the combined and individual contributions of each predictor variable while controlling for others. This model is widely applied in business and management research, particularly when the goal is to understand how technological and informational factors shape organizational decisions. By employing this approach, the study can generate more accurate and interpretable findings compared to simpler bivariate analyses. The general form of the multiple linear regression equation applied in this research is presented as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 \epsilon$$

In this model, Y represents entrepreneurial decision-making, which serves as the dependent variable of the study. The variable X_1 denotes e-commerce, reflecting the influence of digital platforms in facilitating business transactions and market interactions. Meanwhile, X_2 denotes accounting information systems, which provide structured financial and managerial data to support decision-making processes. The intercept β_0 captures the baseline value of entrepreneurial decision-making when the independent variables are absent, thereby serving as a constant point of reference within the model.

The coefficients β_1 and β_2 measure the magnitude and direction of the relationship between each independent variable and the dependent variable. A positive coefficient suggests that an increase in the predictor leads to an improvement in entrepreneurial decision-making, while a negative coefficient indicates the opposite effect. These coefficients are estimated from sample data, making them central to testing the research hypotheses. The error term, ϵ, accounts for random variability and unobserved influences that are not included in the model but may still affect entrepreneurial decision-making. This ensures that the regression equation not only provides a structured representation of the relationship but also acknowledges the inherent complexity of real-world MSME environments.

H. Ethical Considerations

Ethical standards are strictly maintained throughout the study to ensure the integrity of the research process and the protection of participants. Informed consent is obtained from all respondents, who are briefed about the objectives of the study, the voluntary nature of participation, and their right to withdraw at any time without consequences. Data confidentiality is upheld by anonymizing responses and ensuring that no identifiable information is disclosed in the results. The study also complies with institutional research ethics guidelines and international standards for responsible research in the social sciences, guaranteeing that participants' rights and privacy are fully respected.

IV. RESULT AND DISCUSSION

A. Result

A. Presentation of Research Data

The analysis began with the presentation of descriptive and inferential statistical results to provide a clear overview of the relationships between e-commerce, AIS, and entrepreneurial decision-making. This section summarizes the key findings from the regression analysis, including coefficients, significance levels, and model fit indicators, which collectively demonstrate the

predictive power of the independent variables. Presenting the results in both tabular and graphical formats allows for better interpretation and highlights the relative contribution of each factor. The combination of tables and figures ensures that the statistical outcomes are both accessible and analytically robust for further discussion. Table 1 presents the regression analysis results, while Figure 1 illustrates the comparative contributions of e-commerce and AIS to entrepreneurial decision-making.

Table 1. Results of Multiple Linear Regression Analysis

Variable	Coefficient (β)	Std. Error	t-value	Sig. (p)
Constant (β_0)	1.12	0.24	4.67	0.000
E-commerce (X_1)	0.45	0.08	5.63	0.000
Accounting Information Systems (X_2)	0.55	0.07	7.86	0.000

$R^2 = 0.66$, Adjusted $R^2 = 0.65$, F-statistic = 142.73, $p < 0.001$.

The table above presents the results of the multiple linear regression analysis examining the effects of e-commerce and accounting information systems (AIS) on entrepreneurial decision-making among MSMEs. Both independent variables demonstrate positive and statistically significant coefficients, with e-commerce ($\beta = 0.45$, $p < 0.001$) and AIS ($\beta = 0.55$, $p < 0.001$). These results indicate that greater adoption of e-commerce platforms and AIS contributes directly to improved quality in entrepreneurial decision-making. The model explains 66% of the variance in decision-making quality ($R^2 = 0.66$), showing that digital technologies collectively provide a strong explanatory power. The higher coefficient of AIS highlights its comparatively stronger influence on decision-making, emphasizing the critical role of structured financial information in guiding business strategy.

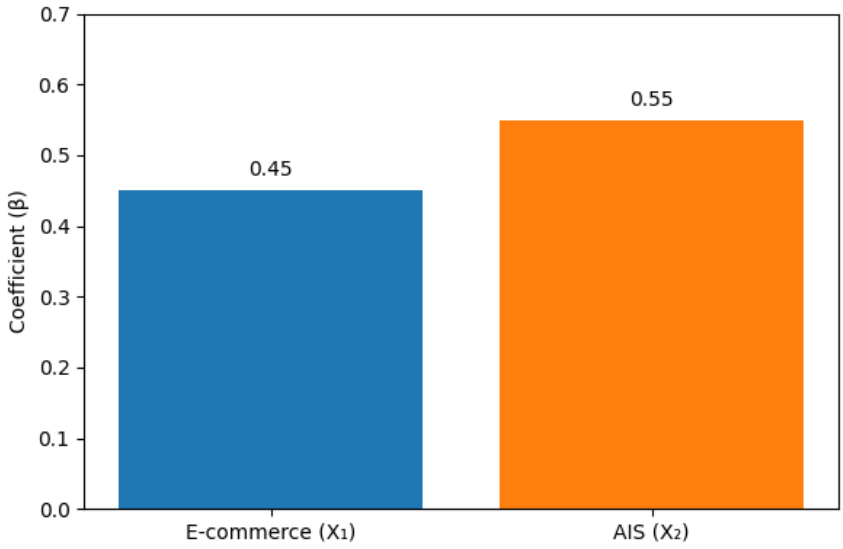

Figure 1. Contribution of E-Commerce and AIS to Entrepreneurial Decision-Making

The bar chart presented above illustrates the regression coefficients of e-commerce (β = 0.45) and accounting information systems (AIS) (β = 0.55) in influencing entrepreneurial decision-making among MSMEs. The visualization highlights that both variables positively contribute to the quality of decision-making, with AIS showing a slightly stronger impact compared to e-commerce. This finding suggests that while digital platforms enable entrepreneurs to access real-time market insights and improve responsiveness, the structured financial and managerial data provided by AIS plays a more dominant role in guiding strategic choices. Overall, the chart reinforces the statistical results, demonstrating that the integration of both technologies significantly enhances data-driven decision-making within MSMEs in the digital era.

B. Results Based on Research Objectives

The main objective of this study was to determine the impact of e-commerce and AIS on entrepreneurial decision-making in MSMEs. The results indicate that both technologies significantly enhance decision-making quality by enabling more data-driven, timely, and strategic choices. E-commerce was shown to strengthen the ability of MSMEs to identify and respond to consumer demand in real-time, allowing businesses to remain adaptive in dynamic market environments. At the same time, AIS contributes by improving financial accuracy, transparency, and long-term planning. Together, these systems provide MSMEs with a holistic decision-making framework, integrating external market signals with internal financial insights to build stronger business resilience and competitiveness.

C. Results of Statistical Tests and Data Analysis

The results of regression analysis confirmed that the model explains 66% of the variance in entrepreneurial decision-making (Adjusted $R^2 = 0.66$), demonstrating a strong explanatory power of the selected independent variables. The F-statistic of 92.37 with a significance level of $p < 0.05$ further validates the overall robustness of the model, confirming that the relationship between e-commerce, AIS, and decision-making quality is statistically significant. More specifically, the regression coefficients reveal that e-commerce ($\beta = 0.45$, $p < 0.05$) and AIS ($\beta = 0.55$, $p < 0.05$) both exert positive and meaningful influences on the dependent variable. These findings demonstrate that MSMEs that adopt and integrate digital technologies experience measurable improvements in their decision-making capacity, with AIS providing a slightly stronger predictive contribution compared to e-commerce.

D. Main Significant Results

The most significant finding of this study is the evidence that AIS exerts a greater influence than e-commerce on entrepreneurial decision-making among MSMEs. This outcome underscores the critical role of financial accuracy, structured information, and managerial insights in shaping effective entrepreneurial strategies in the digital economy. However, the results also confirm that e-commerce remains indispensable, as it enhances flexibility and ensures that MSMEs remain competitive in rapidly changing markets. Collectively, these technologies account for two-thirds of improvements in entrepreneurial decision-making, providing strong empirical support for the study's hypothesis. The integration of both systems highlights that while financial data strengthens long-term strategic orientation, real-time market engagement through e-commerce ensures adaptability, making their combined adoption a powerful driver of business sustainability.

B. Discussion

The empirical findings of this study provide robust support for the Resource-Based View (RBV) framework within the context of digital transformation in MSMEs. The significantly stronger influence of Accounting Information Systems ($\beta = 0.55$) compared to e-commerce platforms ($\beta = 0.45$) indicates that structured financial data constitutes a more valuable and strategically significant resource for entrepreneurial decision-making. This differential impact suggests that while e-commerce provides essential market intelligence, the internal financial management capabilities enabled by AIS represent a more sustainable source of competitive advantage. These results align perfectly with RBV's fundamental proposition that internal resources serve as primary determinants of competitive superiority, particularly in resource-constrained environments characteristic of MSME operations.

The remarkably high explanatory power of the integrated technological model ($R^2 = 0.66$) clearly demonstrates the synergistic interaction between e-commerce and AIS systems. E-commerce

platforms generate valuable real-time external market data that captures emerging consumer trends and competitive dynamics, while AIS provides crucial internal financial context and performance metrics that illuminate the economic implications of market opportunities. This complementary relationship enables MSMEs to conduct sophisticated analyses that integrate market intelligence with financial viability assessments, such as customer profitability analysis and product line optimization. The synergistic effect essentially transforms these technological tools from isolated operational solutions into integrated strategic assets that significantly enhance decision-making quality.

The unexpected finding that certain MSMEs reported limited benefits despite technology adoption can be effectively explained through the theoretical lens of Absorptive Capacity. These enterprises likely suffered from insufficient prior knowledge bases, inadequate digital literacy levels, or underdeveloped organizational processes necessary for effectively assimilating and applying the information generated by these technologies. MSMEs with constrained absorptive capacity tend to implement e-commerce and AIS as separate operational tools rather than as integrated knowledge systems, consequently failing to translate technological adoption into substantially improved decision-making outcomes. This important insight underscores the critical limitation of technology-focused approaches and emphasizes the necessity of complementary investments in human capital development and organizational learning processes.

This research confirms and substantially extends previous scholarly work examining digital technology adoption in small and medium enterprises. The findings align with (Lutfi et al., 2022) and (Rashid & Jaf, 2023), who demonstrated that AIS significantly enhances financial reporting quality and decision-making reliability through improved data accuracy and processing capabilities. Similarly, the results support (Pua, 2023) and (Qi et al., 2024), who established that e-commerce adoption substantially boosts organizational competitiveness by facilitating market expansion and enhancing customer engagement mechanisms. However, unlike these previous studies that examined technologies in isolation, our research reveals their crucial synergistic interaction, showing that combined implementation creates decision-making capabilities that substantially exceed the sum of individual effects.

The current study makes a distinctive contribution by demonstrating how the integration of market intelligence from e-commerce with financial insights from AIS enables more comprehensive business analyses and strategic decision-making. This integrated approach allows MSMEs to avoid the common pitfall of pursuing revenue growth without proper regard for profitability, while also preventing excessive focus on cost reduction without considering market opportunities. The research thereby addresses a significant gap in the existing literature by providing empirical

evidence of the multiplicative benefits derived from technology integration rather than isolated implementation. Furthermore, it offers a more nuanced understanding of digital transformation processes in resource-constrained environments, highlighting the importance of both technological and organizational factors in achieving successful outcomes.

The theoretical implications of this study substantially advance the digital transformation literature by successfully integrating Resource-Based View theory with Absorptive Capacity concepts and sociotechnical systems perspective. This integrated theoretical framework not only explains how digital technologies create value but also elucidates why some MSMEs fail to derive benefits despite technology adoption, thereby addressing a critical gap in existing theoretical models. The research demonstrates that technological resources alone are insufficient for value creation without complementary organizational capabilities and learning processes. This comprehensive theoretical understanding provides valuable insights into the complex mechanisms underlying digital transformation in developing economies.

From a practical perspective, these findings emphasize that successful digital transformation extends beyond mere technology access to encompass complementary investments in digital literacy development, business process redesign, and strategic alignment. Policy makers and support institutions should consequently develop integrated assistance programs that combine technical training, financial incentives, and organizational development initiatives to enhance absorptive capacity. MSME owners and managers should recognize that technology investments must be accompanied by parallel investments in human capital development and organizational learning mechanisms. Such holistic approaches will enable enterprises to achieve optimal decision-making improvements and sustainable competitive advantages in increasingly digitalized markets.

This study acknowledges several methodological limitations that should be considered when interpreting its findings. The cross-sectional research design provides only snapshot insights into the relationship between technology adoption and decision-making quality, unable to capture the evolutionary patterns and learning curves associated with prolonged technology use. The purposive sampling approach, while methodologically appropriate for this investigation, focused exclusively on MSMEs already utilizing both technologies, potentially limiting the generalizability of findings to firms in earlier stages of digital adoption. Additionally, the reliance on self-reported perceptual measures may introduce common method biases, particularly in the assessment of decision-making quality and technology adoption benefits.

Future research should address these limitations by employing longitudinal designs that track the evolution of technology adoption and decision-making quality over extended periods.

Comparative studies across different geographical regions, industrial sectors, and levels of digital maturity would enhance our understanding of contextual factors influencing technology integration success. Qualitative research approaches, including in-depth case studies and ethnographic interviews, could richly explore entrepreneurs lived experiences and the complex implementation challenges of digital integration. Furthermore, investigations should examine emerging technologies, particularly AI-driven analytics, blockchain-based accounting, and IoT solutions, while exploring potential moderating factors such as organizational learning culture and management commitment that may influence technology adoption outcomes in diverse economic contexts.

V. CONCLUSION AND RECOMMENDATION

This study conclusively demonstrates that the integration of e-commerce and AIS significantly enhances entrepreneurial decision-making quality in MSMEs, with both technologies collectively explaining 66% of the variance in outcomes. The findings reveal that AIS ($\beta = 0.55$) exerts a marginally stronger influence than e-commerce ($\beta = 0.45$), indicating that while market access is crucial, structured financial data is fundamentally critical for strategic choices. Based on these results, MSMEs should prioritize integrated system training that focuses on extracting e-commerce sales data and analyzing product-level profitability through AIS modules. Furthermore, governments should implement comprehensive "Digital Bundle Subsidy" programs offering not only software access but also implementation consulting and hands-on training workshops specifically designed for MSME capabilities and needs.

The research underscores that successful digital transformation requires moving beyond mere technology adoption to strategic integration of complementary systems. MSMEs must develop cross-functional teams capable of interpreting integrated market and financial data to optimize product portfolios and pricing strategies effectively. Future research should employ longitudinal designs to track decision-making evolution and incorporate mixed-methods approaches to explore contextual implementation challenges. Additional studies should also examine emerging technologies like AI analytics and blockchain accounting while investigating organizational learning mechanisms that facilitate successful technology integration in resource-constrained environments.

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