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The Effect of it Sophistication Model on the Performance of Cafe and Restaurant Smes in Medan CITY

Sonya Putri[1*], Erlina[2], Keulana Erwin[3], Amlys Syahputra[4], Fahmi Natigor[5]
Universitas Sumatera Utara
Corresponding Author: Sonya Putri Sonyaputri230101@usu.ac.id

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A B S T R A C T

This study aims to analyze the effect of the IT Sophistication model on the performance of MSMEs in cafés and restaurants in Medan City. The independent variable, IT Sophistication, consists of nine dimensions: Technological Sophistication (TS), Informational Sophistication (IS), User Sophistication (US), Functional Sophistication (FS), Managerial Sophistication (MS), Strategic Sophistication (SS), Preventive Sophistication (PS), Detective Sophistication (DS), and Responsive Sophistication (RS). The dependent variable is MSME performance, which includes both financial and non-financial aspects. The research employs a quantitative approach using a questionnaire survey. The population consists of active cafés and restaurants in Medan with service ratings of three to five stars. Primary data were obtained from 150 respondents who are owners or managers of these businesses, selected through saturated sampling. Data were processed using SPSS 25.0, and the research instruments were evaluated through validity and reliability tests. Data analysis included descriptive statistics, multiple linear regression, classical assumption tests (normality, multicollinearity, heteroscedasticity, linearity via Ramsey RESET test), and hypothesis testing. The results indicate that all nine dimensions of IT Sophistication—TS, IS, US, FS, MS, SS, PS, DS, and RS—have a positive and significant impact on MSME performance

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INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) are the backbone of the global economy. In Indonesia, MSMEs play a strategic role in driving national economic growth, creating employment opportunities, and improving public are classified according to asset ownership and annual turnover: micro enterprises possess net assets of up to IDR 50 million with annual turnover of up to IDR 300 million; small enterprises have assets of up to IDR 500 million and turnover of up to IDR 2.5 billion; while medium enterprises have assets of up to IDR 10 billion or an annual turnover of up to IDR 50 billion (Regulation of the Audit Board of the Republic of Indonesia, 2008).

MSMEs contribute significantly to job creation and the strengthening of industrial growth (Al Khasawneh, Momani, & Khazaleh, 2021). MSMEs have also proven to be resilient in facing various crises, including their ability to adapt through digitalization, collaboration, and innovation (Aditiya et al., 2024; Suryanuddin, 2024). The performance of MSMEs is determined by their ability to adapt to technological developments, the strengthening of entrepreneurial competencies, and the support of government policies (Surya, 2024; Aisyah, 2024).

MSME performance reflects a firm's ability to achieve its operational objectives effectively and efficiently, encompassing financial performance, marketing performance, innovation, and business sustainability (Jang, Kim, & Park, 2023). Strong performance indicates an MSME's capability to manage limited resources to generate optimal output and to adapt to dynamic market conditions (Rahman, 2024). According to Chen, Lin, and Lee (2021), MSME performance can be enhanced through the utilization of information technology that accelerates business processes and improves operational efficiency. Furthermore, innovation and adaptability to environmental changes further strengthen competitiveness and business sustainability (Jang, Kim, & Park, 2023).

In the context of the café and restaurant sector, MSME performance encompasses effectiveness in managing daily operations, service quality, customer satisfaction, and the ability to maintain profitability amid intense competition. The utilization of digital technologies, such as online-based ordering systems, digital payment platforms, and cloud-based inventory management, has become a crucial strategy for improving efficiency and service quality (Rahman, 2024). However, some MSME actors in this sector still face obstacles in technology adoption due to limited infrastructure and human resources, which in turn affects performance optimization (Li, Wang, & Zhang, 2021). The improvement of MSME performance in the café and restaurant industry depends not only on managerial capability but also on technological readiness and digital innovation that can drive efficiency, competitiveness, and long-term business sustainability. Several studies have shown that MSME performance contributes significantly to economic growth in various countries (Mubarak, Shaikh, & Mastoi, 2019). In Europe, a report by the European Investment Fund (2024) notes that MSMEs account for 46.7% of the financial sector and employ approximately 89 million people, representing 65.3% of the total workforce. In India, the contribution of MSMEs to GDP has reached 30%, employing more than 110 million people, with the potential to increase to 40% of

the national GDP by 2030 (International Finance Corporation, 2024). In Pakistan, MSME performance demonstrates its contribution to GDP through information technology output (Mubarak et al., 2019). In China, MSMEs contribute approximately 60% of the national GDP and 50% of tax revenue, reflecting their strategic role in the country's economic and fiscal system (European Union Small and Medium Enterprises Centre, 2024). In Vietnam, MSMEs play a significant role in job creation and productivity (Nguyen et al., 2022). In Malaysia, MSME performance strengthens intellectual capital, innovation, and information technology integration (Hashim, Osman, & Khamis, 2023; Talib, Razak, & Mahmud, 2023).

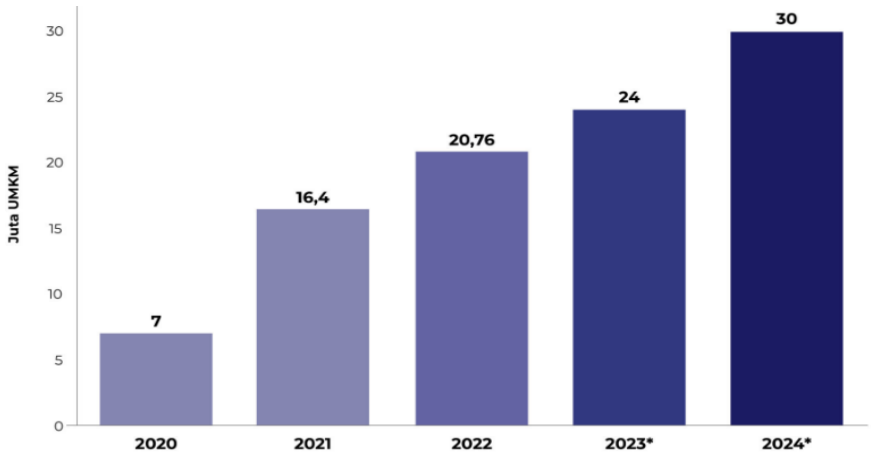

Fig 1. MSMEs entering the digital ecosystem in Indonesia from 2020 to 2024
Source: Statistics Indonesia, 2024

Figure 1. illustrates the increase in the number of MSMEs entering the digital ecosystem in Indonesia from 2020 to 2024. It can be observed that the number of digital MSMEs has continued to grow significantly each year. In 2020, the number reached only 7 million, then increased to 16.4 million in 2021, and further rose to 20.76 million in 2022. The upward trend continued in 2023, reaching a total of 24 million MSMEs, and in 2024 it is estimated to reach 30 million MSMEs integrated into the digital ecosystem. This trend indicates that the digitalization of MSMEs in Indonesia is progressing very rapidly, reflecting the increasing adoption of technology in business activities.

This digital transformation is crucial as it enables MSMEs to overcome various traditional limitations, such as access to capital, marketing, operational management, and market connectivity. Consequently, digitalization makes a substantial contribution to enhancing MSME productivity and performance, which ultimately supports overall national economic growth. Digital transformation has been developing at a very rapid pace in line with technological advancement (Vial, 2019). Information Technology (IT) also has the potential to enhance competitive advantage and organizational performance (Vial, 2019).

The slow adoption of technology-based accounting and IT sophistication among MSMEs remains a critical issue, as the sustainability of MSMEs in developing countries largely depends on technology adoption (Loo & Ramachandran, 2020). Tripathi and Singh (2024) argue that MSMEs' awareness of digital transformation significantly influences their use of IT, which in turn has a positive impact on MSME performance. In Medan City, the performance of café and restaurant MSMEs shows the highest level of production compared to other business sectors (Statistics Indonesia of Medan City, 2024). However, research on IT sophistication in the café and restaurant sector remains limited compared to other sectors (Bunga et al., 2024).

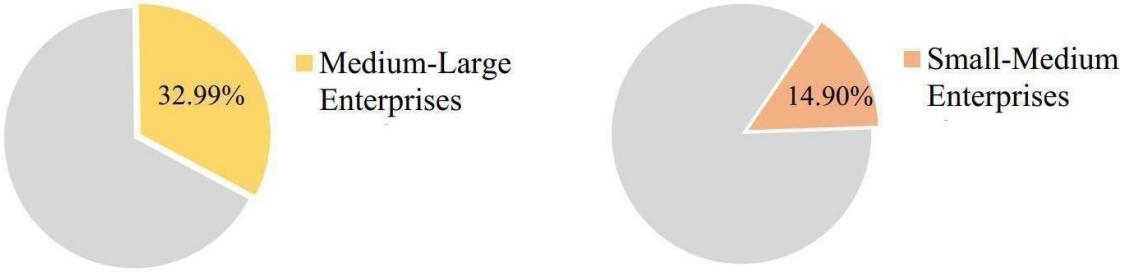

Fig 2. The Utilization of Technology-Based Information Systems by MSMEs in Indonesia
Source: Statistics Indonesia, 2024

Based on Figure 2, the utilization of technology-based information systems by MSMEs in Indonesia shows that Medium–Large Enterprises account for a proportion of 32.99%, while Small–Medium Enterprises reach only 14.90%. These data indicate that medium-to-large-scale enterprises have a more dominant contribution to the economy compared to small and medium enterprises. This disparity reflects differences in capacity in terms of resources, market access, and the adoption of technology, which remain major challenges for the small and medium enterprise sector in enhancing its competitiveness (Statistics Indonesia, 2024). The focus of this study is to analyze the effect of the IT Sophistication model on the performance of café and restaurant MSMEs in Medan City, with the aim of understanding the extent to which the level of IT sophistication influences business effectiveness and sustainability. In the highly competitive culinary industry, the utilization of technology is not merely an operational support tool but also a strategic factor in enhancing efficiency, service quality, and business competitiveness. The level of technology acceptance and implementation among café and restaurant MSME operators remains varied, influenced by internal factors such as human resource capacity and infrastructure, as well as external factors such as market dynamics and the progress of digitalization. Therefore, this study is essential to analyze and understand the factors affecting technology acceptance and the impact of information technology usage on business performance. Based on this background, the study examines the factors influencing the performance of café and restaurant MSMEs in Medan City through the IT Sophistication model.

LITERATURE REVIEW

Contingency Theory

Contingency theory is a framework that states that organizational performance will be optimal when there is a fit between information technology systems and the contingency factors that influence the organization (Raymond & Paré, 1992). This study adopts contingency theory as its theoretical foundation. According to Raymond and Paré (1992), contingency theory posits that there is no single information system that is universally effective for all organizations.

The Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) is one of the most widely used models to explain the factors influencing individuals' acceptance and use of technology. This model was first developed by Davis (1986) and further elaborated in his publication in 1989. TAM emphasizes two main constructs, namely perceived usefulness and perceived ease of use, which are believed to determine users' attitudes and behavioral intentions in adopting a system (Davis, 1989). Perceived usefulness refers to the extent to which an individual believes that using a particular technology will enhance their performance, while perceived ease of use refers to the degree to which a person believes that the technology is easy to understand and operate.

MSMEs are a form of organization consisting of groups of individuals who work together to achieve specific goals (Robbins & Coulter, 2010). According to Article 1 of Law No. 20 of 2008, MSMEs are defined as independent business entities established through ideas and innovations by productive individual entrepreneurs. Based on Government Regulation No. 7 of 2021, these enterprises are classified according to their total annual revenue or sales and the total assets owned by the business entity or company. Table 2.1 presents the criteria that differentiate micro, small, and medium enterprises.

Organizational performance represents an organization's ability to achieve its objectives, such as improving operational efficiency, service quality, and public satisfaction (Khin & Ho, 2018). This performance can be assessed from both financial and non-financial perspectives (Nguyen & Nguyen, 2024). Such implementation is carried out to support direct business digitalization, leading MSMEs to invest in information technology through the use of integrated information systems (Raymond et al., 2011). Integrated information systems are employed to measure organizational performance within dynamic environments (Khin & Ho, 2018). Dynamic environments facilitate decision-making and accountability (Krekel & Council Members, 2019; Otto et al., 2020). In addition, leveraging IT sophistication supports efficiency, reduces errors, and enables data-driven decision-making (Wardhana et al., 2022).

According to Otley (1980), **AIS sophistication** emphasizes the alignment between technology, information, functional processes, and management with an organization's strategy and structure to enhance efficiency and decision-making quality. Bharadwaj (2000) highlights infrastructure capability and human skills, while Weill and Olson (1989) emphasize system integration and application.

1. **Technological Sophistication (TS)**

TS refers to the use of hardware, software, cloud systems, and multiplatform technologies that support system integration (Raymond & Paré, 1992; Ciriello et al., 2021). Modern technology enhances operational efficiency, connectivity, and competitive advantage (Winkler & Xiao, 2021; Gfrerer & Krcmar, 2023).

2. **Informational Sophistication (IS)**

IS assesses an organization's capability to manage, integrate, and automate information to support accurate and timely decisions (Kesuma et al., 2025). Centralized databases, cross-functional applications, and real-time dashboards strengthen coordination and data quality (Raymond & Paré, 1992; Saunders & Keller, 1983).

3. **User Sophistication (US)**

US measures users' competence, participation, and autonomy in leveraging IT strategically (Nambisan et al., 2017). Active user involvement accelerates technological adoption and digital transformation (Botol, 2021; Kane et al., 2015).

4. **Functional Sophistication (FS)**

FS reflects the institutionalization of IT functions through internal IT units, documented procedures, and cross-department coordination (Raymond & Paré, 1992). Strong IT governance enhances system implementation and operational alignment (Ciriello et al., 2021).

5. **Managerial Sophistication (MS)**

MS includes strategic IT planning, budgeting, post-implementation evaluation, and integrating IT into long-term organizational goals (Gremillion, 1984; Weill & Woerner, 2015). Managerial commitment is essential for successful system adoption.

6. **Strategic Sophistication (SS)**

SS reflects the integration of IT into strategic planning and the involvement of top management in IT-related decisions (Bharadwaj, 2000; Luftman, 2004). IT-business alignment enhances organizational adaptability to environmental changes.

7. **Preventive Sophistication (PS)**

PS covers security policies, access controls, encryption, and cybersecurity literacy to prevent incidents (ISO/IEC 27001:2022; Kesuma et al., 2025). Strong preventive controls support effective internal control and organizational performance.

8. **Detective Sophistication (DS)**

DS focuses on detecting security incidents through audit logs, IDS, SIEM, and real-time monitoring (NIST, 2006; Cram et al., 2022). Effective detection relies on organized monitoring policies and skilled IT personnel.

9. **Responsive Sophistication (RS)**

RS reflects an organization's ability to respond to and recover from security incidents through incident response teams, SOPs, simulations, and business continuity plans (NIST SP 800-61r2; ISO/IEC 27031:2022). Rapid response strengthens digital resilience.

Research Hypotheses

1. H1: **Technological Sophistication (TS)** has a positive and significant effect on the performance of MSMEs in Medan City.
2. H2: **Informational Sophistication (IS)** has a positive and significant effect on the performance of MSMEs in Medan City.
3. H3: **User Sophistication (US)** has a positive and significant effect on the performance of MSMEs in Medan City.
4. H4: **Functional Sophistication (FS)** has a positive and significant effect on the performance of MSMEs in Medan City.
5. H5: **Managerial Sophistication (MS)** has a positive and significant effect on the performance of MSMEs in Medan City.
6. H6: **Strategic Sophistication (SS)** has a positive and significant effect on the performance of MSMEs in Medan City.
7. H7: **Preventive Sophistication (PS)** has a positive and significant effect on the performance of MSMEs in Medan City.
8. H8: **Detective Sophistication (DS)** has a positive and significant effect on the performance of MSMEs in Medan City.
9. H9: **Responsive Sophistication (RS)** has a positive and significant effect on the performance of MSMEs in Medan City.

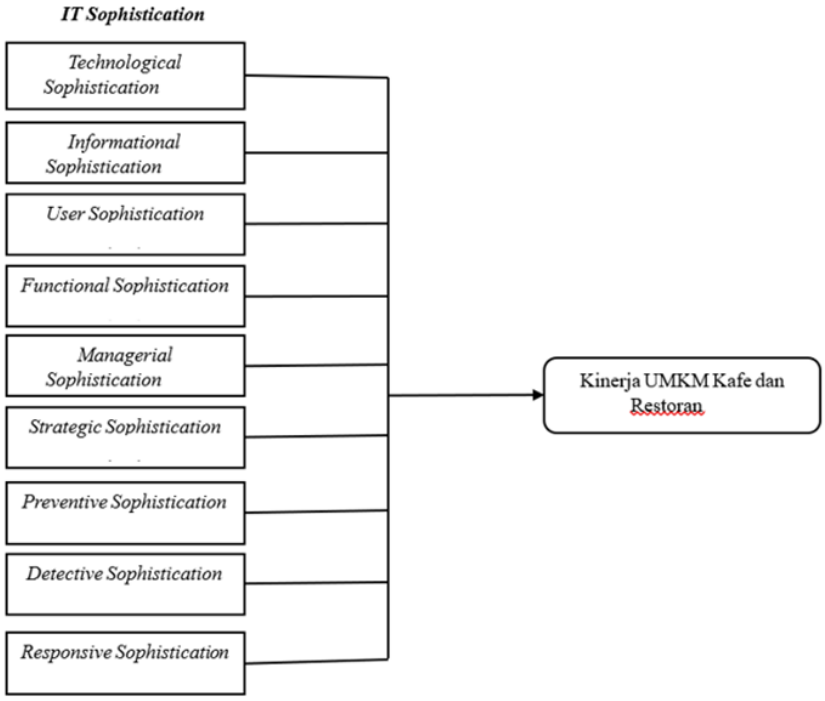

Fig 3. Conceptual Framework

METHODOLOGY

The research design outlines the strategies for collecting and analyzing data to produce valid and reliable conclusions (Öztürk, Kocaman, & Kanbach, 2024). This study employs a quantitative research method, which systematically describes phenomena using primary data and objectively examines population characteristics (Saunders, Lewis, & Thornhill, 2023). Data analysis is conducted using descriptive statistics and validity testing to ensure accurate findings (Creswell & Guetterman, 2024).

Based on its data collection approach, this study uses a survey method through a structured questionnaire tailored to the research objectives (Sekaran & Bougie, 2019). In terms of its time dimension, the research adopts a cross-sectional design, which collects data at a single point in time to capture the prevailing conditions of the phenomenon under study (Creswell & Creswell, 2018). A cross-sectional design provides descriptive or explanatory insights within one period without assessing long-term changes (Hair, 2020). These insights form the basis for understanding current dynamics and predicting future developments (Hair, Page, & Brunsveld, 2020).

The research employs a quantitative approach using a questionnaire survey. The population consists of active cafés and restaurants in Medan with service ratings of three to five stars. Primary data were obtained from 150 respondents who are owners or managers of these businesses, selected through saturated sampling. Data were processed using SPSS 25.0, and the research instruments were evaluated through validity and reliability tests. Data analysis included descriptive statistics, multiple linear regression, classical assumption tests (normality, multicollinearity, heteroscedasticity, linearity via Ramsey RESET test), and hypothesis testing. The results indicate that all nine dimensions of IT Sophistication—TS, IS, US, FS, MS, SS, PS, DS, and RS—have a positive and significant impact on MSME performance. These findings demonstrate that advanced technological capabilities enhance competitiveness, operational efficiency, and service quality among MSMEs. The originality of this study lies in its explicit fragmentation of IT sophistication dimensions and their influence on MSME performance within Medan's café and restaurant sector, a topic rarely examined in previous research.

RESULTS AND DISCUSSION

The study results indicate model IT sophistication TS, IS, US, FS, MS, SS, PS, DS, and RS, all have a positive and significant effect on the performance of MSMEs in cafés and restaurants in Medan. SS, reflecting the alignment of IT strategy with long-term organizational goals, top management involvement, and strategic planning, enhances efficiency, innovation, and competitive advantage (Bharadwaj, 2000; Botol, 2019; Kesuma et al., 2025). PS, encompassing formal security policies, access controls, firewalls, encryption, and user training, strengthens information reliability and internal control (Kesuma et al., 2025; Hutabarat et al., 2025). DS, including audit trails, intrusion detection systems, and incident monitoring, improves transparency, risk management, and decision-making accuracy (Kesuma et al., 2025; Sutanto & Widagdo, 2024). RS, involving incident response teams, documented SOPs, simulations, and business continuity planning (BCP, RTO, RPO), ensures rapid recovery and system resilience (Kesuma et al., 2025; Indu et al., 2022). These findings are consistent with **Contingency Theory**—emphasizing alignment between IT mechanisms and organizational needs—and the **Technology Acceptance Model (TAM)**, as higher sophistication enhances perceived usefulness and ease of use, thereby improving overall MSME performance.

Table 1. Normality Test Kolmogorov-Smirnov

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		150
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	3.11943831
Most Extreme Differences	Absolute	.100
	Positive	.072
	Negative	-.100
Test Statistic		.100
Exact Sig. (2-tailed)		.093
a. Test distribution is Normal.		
b. Calculated from data.		
c. Lilliefors Significance Correction.		

Based on Table, the probability value (Exact Sig. 2-tailed) is 0.093 > α (0.05), indicating that the residuals are normally distributed.

CONCLUSION AND RECOMMENDATION

Based on the results of this study, it can be concluded that Technological Sophistication (TS), Informational Sophistication (IS), User Sophistication (US), Functional Sophistication (FS), Managerial Sophistication (MS), Strategic Sophistication (SS), Preventive Sophistication (PS), Detective Sophistication (DS), and Responsive Sophistication (RS) all have a positive and significant effect on the performance of MSMEs in cafés and restaurants in Medan City. Recommendation for Business owners are encouraged to strengthen customer engagement and maximize the use of technology in their application systems to attract more customers and improve operational efficiency.

FUTHER STUDY

Future studies are recommended to explore additional variables beyond this research, such as experiential marketing, store atmosphere, and others, to obtain more varied and comprehensive findings.

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