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Navigating the Digital Era: How Digital Transformational Leadership Enhances MSMEs' Financial Success

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ABSTRACT

The advent of digital technology has revolutionized the business ecosystem, particularly for MSMEs. Digital transformation significantly impacts MSMEs' operations, necessitating leaders to promote technology integration to achieve financial success. This study employs a quantitative methodology by examining and analyzing distributed questionnaires (n = 178) to assess the impact of digital transformational leadership on financial performance, with digital technology adoption as a mediator. The findings reveal that digital transformational leadership and technology adoption positively and significantly affect MSMEs' financial performance. Additionally, the study highlights the crucial role of digital technology adoption in mediating the relationship between digital transformational leadership and financial performance. Our research provides deeper insights into how digital transformational leadership and technology adoption influence MSMEs' financial outcomes. The results provide valuable insights into the correlation among leadership style, digital technology adoption, and financial performance enhancement in MSMEs.

JEL Classifications: G00, M00, M12, O330

Keywords: digital transformational leadership, digital technology adoption, financial performance, MSMEs, digital transformation

I. INTRODUCTION

The economic environment is undergoing a significant transformation, and the United Nations declaration of economic growth and development has emerged as a significant challenge (Maksum et al., 2020). Most countries are striving to enhance their economies by implementing a variety of strategies, including the development of economic sectors and industrial productivity through the promotion of Micro, Small, and Medium Enterprises (MSMEs). This is especially relevant in developing countries like Indonesia, where MSMEs play a significant role in the economy. MSMEs are regarded as economic development drivers due to their ability to generate employment opportunities and augment the Gross Domestic Product (GDP) (Tambunan, 2011; Thathsarani and Jianguo, 2022). In addition, the significant role of MSMEs in the country's economic development not only contributes to the aforementioned but also has a social impact on welfare and poverty reduction (Rahayu and Day, 2015). Nevertheless, MSMEs encounter a variety of significant obstacles in the pursuit of sustainability, including the availability of capital, the ability to access business information, bureaucratic and regulatory issues, competition, innovation and knowledge, and, particularly, digital and financial transformation (Chouki et al., 2019; Thathsarani and Jianguo, 2022).

Change is one of the most prevalent obstacles that organizations encounter when conducting business. The industrial revolution, which is focused on the development of new digital technologies such as Industry 4.0, has significantly altered the way businesses operate. This era is distinguished by the widespread and rapid technological innovation that affects all facets of life, society, business, and governance (Rizvi et al., 2024). It is widely recognized that technology has provided advantages in the following areas: cost reduction, sales growth, productivity enhancement, market expansion, and customer loyalty (Rahayu and Day, 2015; Ghobakhloo and Ching, 2019; Rahman et al., 2020). The adoption of technology by MSMEs will enhance the value creation process, enhance performance, and facilitate the attainment of business sustainability objectives (Rahman et al., 2020). In Indonesia, numerous micro, small, and medium-sized enterprises (MSMEs) have implemented technologies such as e-commerce, social media, online marketing, and digital payments to facilitate their operations (Trinugroho et al., 2022). The concept of smart MSMEs is the integration of information technology with the fundamental processes of SMEs, resulting in a more complex and integrated system (Ghobakhloo and Ching, 2019). In particular, the utilization of digital technology by MSMEs can enhance financial inclusion and access to external credit facilities (Afandi et al., 2024).

Economists are concerned about the impact of the lack of access to finance on MSMEs, which has a significant impact on a variety of economic and social aspects (Mushtaq et al., 2022). The capacity of MSMEs to enhance their financial sustainability is frequently impeded by their inadequate financial resources (Rahman et al., 2020). MSMEs are regarded as a vulnerable sector that necessitates support through a variety of capital assistance programs or credit schemes, technical assistance, and collaboration with larger corporations (Maksum et al., 2020). Generally, large organizations comprehend the necessity of incorporating technology to enhance their financial sustainability and operational efficiency. In the same vein, MSMEs that innovate in technology will facilitate financing access, thereby enhancing the efficacy and productivity of their operations (Trinugroho et al., 2022). In addition to altering the

operations of the financial sector, emerging technologies will also catalyze the development of financial technologies that have the potential to revolutionize financial services. By augmenting business transactions through digital channels, it will establish an alternative pathway to financing for micro, small, and medium-sized enterprises. The quality and efficiency of business operations and financial activities will be significantly enhanced through the implementation of technology. MSMEs may mitigate operational expenses, enhance transparency and standardization, and decrease labor utilization in this scenario (Thathsarani and Jianguo, 2022). The adoption of social media has a substantial impact on financial sustainability, which in turn enhances the financial stability and growth of MSMEs (Rahman et al., 2020) by providing a comprehensive understanding of MSMEs. Furthermore, Afandi et al. (2024) offer empirical evidence that the financial literacy level of Ultra-Micro, Micro, and Small Enterprises (UMSEs) can be influenced by the adoption of digital technology, which can enhance performance.

The concept of transformational leadership has emerged as a proactive response to the ongoing challenges of digital transformation, to promote the adoption of technology that supports the operational and financial performance practices of MSMEs. Leadership is crucial for the development of initiative and sensitivity in the management of MSMEs (Chang et al., 2023). The critical role of leadership in facilitating the adaptation of companies and employees to technology is reinforced by its capacity to guide the organization through the intricacies of digital transformation. Senadjki et al. (2024) suggested that an effective leadership style will enhance the efficiency and effectiveness of an organization in the face of the complexity of digital transformation. Particularly, transformational leadership must guarantee that organizational members maintain an optimistic perspective regarding digital transformation. The function of transformational leadership will become more critical in the effective management of organizations, thereby enhancing organizational performance and promoting the adoption of digital technology. Their research has identified how financial performance can be enhanced through digital transformational leadership, as indicated by these discussions. Hung et al. (2023) highlighted that the performance of an organization is influenced by digital leadership. This pertains to the ability, experience, predictability, and vision of digital leadership that is focused on digital transformation, which is the primary factor contributing to the company's financial performance. Therefore, transformational leadership has the potential to enhance digital transformation in organizations (Gun et al., 2024). This underscores the crucial role of leadership, which will facilitate the success of digital transformation by instilling employee confidence. Moreover, in this scenario, digital transformation will be instrumental in achieving effective financial performance for the organization by enabling it to adapt and innovate in evolving digital environments. Consequently, additional research is required to generate empirical evidence that demonstrates the impact of digital transformation on organizational performance.

Despite the substantial literature on digital transformation and MSMEs, a distinct theoretical gap persists in elucidating how digital transformational leadership facilitates the adoption of digital technologies, hence influencing financial performance. Prior research has inadequately examined the influence of leaders possessing a digital mindset on the adoption of digital technology and the financial performance of MSMEs (Nasir et al., 2022; Senadjki et al., 2023; Afifa et al., 2024). Moreover, numerous research investigations regard leadership and digital technology adoption as distinct predictors of

performance, neglecting to examine digital technology adoption as a conduit linking the leadership relationship to enhanced MSME financial performance (Shahzad et al., 2022 Alakaş, 2024; Ly, 2024). Furthermore, from a resource-based view perspective (RBV), performance advantages derive not merely from access to technology, but from the utilization of firm-specific capabilities that transform resources into value (Afriyie et al., 2019; Marino-Romero et al., 2022; Alakaş, 2024). Thus, the lack of a capabilities-based explanation obscures the mechanisms through which leadership mobilizes resources and facilitates the adoption of commercially productive digital technologies, especially in resource-constrained MSMEs.

To address this gap, this research aims to address the research gap by creating a research model that examines the impact of digital transformational leadership on financial performance through the mediation of digital technology adoption in the context of MSMEs from the perspective of RBV. This research offers a comprehensive explanation and insight into the interaction between organization and technology. To be more precise, the research offers theoretical and practical contributions that will elucidate the mechanisms that underlie the adoption of digital technology among MSMEs by emphasizing the role of digital transformational leadership in promoting financial performance. Consequently, the financial performance of MSMEs can be enhanced by the adoption of digital technology, particularly by fostering the involvement of digital transformational leadership.

II. LITERATURE REVIEW, HYPOTHESIS DEVELOPMENT, AND PRIOR RESEARCH

A. Prior Research

The researcher endeavored to accumulate numerous studies that were more pertinent to the subject matter in order to identify voids in this research. The research offers the author a comprehensive comprehension of the significance of integrating digital technology to enhance organizational performance. AlNuaimi et al. (2022) recognized the critical role of digital transformational leadership in the advancement of digital transformation, as well as the significance of digital strategy. This research posits that transformational leadership is a catalyst for organizational change in companies located in developing countries. The trust transfer system for SMEs in developing countries is supported by the role of transformational leadership in generating organizational agility through digital transformation (Ramadan et al., 2023). Kaddumi et al. (2023) demonstrate that the financial performance of commercial institutions in developing countries will be enhanced by the implementation of financial technology (FinTech). Financial performance can be enhanced by the adoption of FinTech by banks, which results in an increase in efficiency and service quality. Ultimately, Gun et al. (2024) demonstrate that digital transformational leadership will enhance financial and operational performance by implementing digital transformation. The company will be directed to capitalize on digital transformation in developing countries by this leadership position. The author's comprehension of the identified topics will be enhanced by utilizing the results of this previous research as a reference to establish strong perspectives and foundations. This research identified a gap in the identification of the leadership role of digital transformation with a focus on improving the financial performance of MSMEs in

Indonesia as a developing country by situating the adoption of digital technology as a mediator, based on references from previous research. Table 1 delineates the process of identifying gaps in detail.

Table 1
Prior Research and Gap Identification

Author(s)	DTL	DTA	FP	DTA as Mediator	MSMEs	Research Conducted in Developing Countries	Findings
AlNuaimi et al., (2022)	✓	×	×	×	×	✓	This study offers significant insights into the influence of digital transformational leadership and organizational agility on digital transformation, as well as the significance of digital strategy.
Ramadan et al., (2023)	✓	×	×	×	✓	✓	The findings indicate that digital transformational leadership has the potential to foster organizational agility through the implementation of effective digital transformation and innovation, facilitated by a trust transfer system.
Kaddumi et al., (2023)	×	✓	✓	×	×	✓	The results indicate that the integration of financial technology (FinTech) into the banking sector, specifically through financial inclusion, alternative payment methods, and automation, is directly linked to the financial

Author(s)	DTL	DTA	FP	DTA as Mediator	MSMEs	Research Conducted in Developing Countries	Findings
Gun et al., (2024)	✓	×	✓	×	×	✓	performance of commercial banks. The findings demonstrate that transformational leadership has been empirically shown to enhance financial and operational performance by means of digital transformation.
This Study	✓	✓	✓	✓	✓	✓	The results suggest that digital transformational leadership can enhance financial performance by implementing digital technology in Indonesian MSMEs.

B. Literature Review and Hypothesis Development

1. The Development of MSMEs in Indonesia

Micro, Small, and Medium Enterprises (MSMEs) are independent business entities owned by individuals and engaged in productive activities (Tambunan, 2019). MSMEs in industrialized countries are recognized as a catalyst for innovation in manufacturing and technology. MSMEs play a crucial role in generating new job possibilities and are adaptable in fulfilling market demand (Prabowo et al., 2020). MSMEs are crucial contributors to economic activity due to their prevalence in the domestic business landscape and their significant role in employing a large portion of the workforce (Tambunan, 2011). MSMEs can effectively navigate economic crises as they exhibit comparable levels of productivity to major firms. Furthermore, the uncomplicated and adaptable nature of MSMEs, which are not reliant on markets and formal loans, facilitates the modification of marketing techniques (Berry et al., 2001). Its contribution to economic development is crucial in generating Gross Domestic Product (GDP), hence mitigating its effect on unemployment (Tambunan, 2011). Extensive literature has demonstrated that both developed and developing nations have recognized the potential of MSMEs in alleviating poverty, reducing inequality, and generating employment opportunities (Pandya, 2012; Tambunan, 2019; Woźniak et al., 2019; Surya et al., 2021).

Indonesia, a developing nation, actively engages in economic endeavors stemming from MSMEs. MSMEs are classified into three distinct sorts of business entities: micro

businesses, which have a maximum asset worth of IDR 50 million and yearly sales of up to IDR 300 million. Furthermore, this category encompasses small enterprises that possess assets valued between IDR 50 million and IDR 500 million, as well as yearly revenues ranging from IDR 300 million to IDR 2.5 billion. Medium enterprises are defined as commercial entities having assets ranging from IDR 500 million to IDR 10 billion, and yearly revenues ranging from IDR 2.5 billion to IDR 50 billion (Tambunan, 2019). During the economic crisis of 1998, MSMEs in Indonesia demonstrated resilience and managed to endure. This was attributed to the self-sufficiency of MSMEs, their limited reliance on imported materials and external relationships, and their independence from banking institutions, which enabled their continued existence and resilience (Maksum et al., 2020). Maksum et al. (2020) highlighted the importance of prioritizing the development of MSMEs in Indonesia to enhance strategic options for addressing global economic instability. According to data from the Coordinating Ministry for Economic Affairs (2023), Indonesia currently has 65.5 million MSMEs, accounting for 99% of all business units, and they contribute 61% to the country's GDP and employ 97% of the entire workforce. Most Indonesian micro, MSMEs operate in a wide range of sectors, including retail commerce, handicraft production, footwear, vehicle and motorcycle repair and maintenance, food and drinks, tobacco, and textiles and garments (Tambunan, 2019). Therefore, MSMEs have a significant prospect for ongoing growth due to extensive market backing and the availability of sufficient raw materials and resources (Hernita et al., 2021).

In order to adapt to the constantly evolving business environment, it is necessary for human resources to enhance their competitiveness by improving efficiency and fostering the growth of MSMEs (Hernita et al., 2021). Undoubtedly, in order to maintain competitiveness, company strategies have undergone transformations in the areas of marketing, procurement, and fostering relationships between marketers, customers, and suppliers through the utilization of technology (Rahayu and Day, 2015). They highlighted the significance of technology empowerment in enabling MSMEs to engage with internal and external stakeholders, promote products, conduct research and development operations, do market and product analysis, place orders with suppliers, and accept orders from customers. Undoubtedly, this will enhance market penetration and accelerate the transformation of economic frameworks by fostering greater productivity (Surya et al., 2021). Specifically, enhancing client retention is a crucial factor in the implementation of information technology. Social media enables the direct identification and analysis of client demands through brand communities or customer-formed discussion forums (Eggers et al., 2017). By enhancing managerial assistance, strategic business and product planning, expertise in science and technology, streamlined and productive manufacturing processes, and the capacity for pioneering breakthroughs and innovations, the competitiveness of MSMEs will be heightened (Hernita et al., 2021). The Indonesian government is obligated to implement measures to facilitate the integration of technology by MSMEs (Tambunan, 2011). An effective measure to promote economic growth is to facilitate company optimization by streamlining the licensing procedure using the Online Single Submission (OSS) system. It is anticipated that this will promote the use of technology, enabling MSMEs to thrive and expand, sustain production, and make a significant contribution to driving the national economy (Surya et al., 2021).

2. Digital Transformation Leadership and Financial Performance

Companies cannot avoid the role of digital transformation in economic activity (Gun et al., 2024). A company's competitive edge is its capacity to effectively and efficiently adapt and respond to changes in strategy, market dynamics, technical advancements, trends, and competition (Felipe et al., 2017). Organizations can embrace change when they possess a strong dedication, including the necessary resources, skills, competencies, and leadership to facilitate change. Leaders who endorse change have the ability to promote the growth and proficiency of employees, as well as implement strategic plans that have an impact on output and overall organizational performance (Senadjki et al., 2024). From an RBV perspective, leadership represents a higher-order managerial capability that enables firms to mobilize, integrate, and deploy internal resources in ways that support value creation and performance improvement. Leaders who are focused on digital transformation have a comprehensive understanding of their roles and the purpose, timing, and rationale for the usage of technology (Gun et al., 2024). Adopting digitalization for operational procedures and infrastructure will enhance companies' financial performance. This occurs due to the availability of technological automation systems that can execute corporate activities with greater efficiency and precision. As a result, expenses can be reduced, productivity can be enhanced, and market reaction may be accelerated (Ukko et al., 2019; Nasiri et al., 2020). A leader's responsive stance towards digital transformation entails more than just the adoption of new technology. It also encompasses the impact of technology on the company's operations and interactions with stakeholders.

Several studies have found various aspects that influence financial performance, including digital transformation, digital literacy, digital inclusive finance, knowledge, and leadership (Son et al., 2020; Frimpong et al., 2022; Zhang et al., 2023; Gun et al., 2024). Leadership plays a crucial role in establishing the conducive atmosphere required for achieving goals through digital integration (Gun et al., 2024). Leaders in the current business landscape must possess a comprehensive understanding of the tools, applications, and digital solutions that can be employed to facilitate decision-making. Specifically, the utilization of digital technology in the financial performance of MSMEs provides the opportunity to obtain financial reports and secure finance (Frimpong et al., 2022). The financial performance of MSMEs is intricately linked to the utilization of knowledge and technology through skilled resources, which have the capacity to enhance business productivity and ensure financial stability (Ukko et al., 2019). Furthermore, Son et al. (2020) verified that transformational leadership effectively motivates subordinates to exchange information, leading to enhanced financial performance in MSMEs. Within the RBV framework, the impact of digital transformational leadership on financial performance is explained through its role in shaping firm-specific capabilities that allow digital resources to be converted into economically valuable outcomes, rather than through technology adoption alone. In this scenario, leaders can offer motivation and ignite individuals' drive to attain financial performance that generates profits. From the given description, this study may formulate the following hypothesis:

H1: Digital transformation leadership positively and significantly influences the MSMEs' financial performance.

3. Digital Transformation Leadership and Financial Performance

Financial performance is crucial for business sustainability as it enables businesses to make informed decisions, enhance overall performance, and foster responsibility (Gyamera et al., 2023; Kurniasari et al., 2023). Financial performance refers to the operational and investment operations of a corporation that encompass the business management process of creating profits (Daud et al., 2022). Enhancing financial performance involves the participation of financial intermediaries, such as investors, venture capitalists, and creditors, who give finances, experience, and collaborative networks to facilitate business expansion (Daud et al., 2022; Shabbir & Wisdom, 2020). Gao et al. (2023) established a correlation between business size, profitability, and growth, and the number of profitable investments made by enterprises to sustain their competitiveness. Furthermore, the evaluation of financial performance is conducted by analyzing the company's financial reports or financial ratios derived from its business operations (Malesev & Cherry, 2021). Companies that demonstrate strong financial performance typically exhibit enhanced flexibility and a heightened ability to engage in collaborative efforts and make investments, so increasing their likelihood of achieving success (Kurniasari et al., 2023). Successful firms are typically led by highly skilled individuals who possess the capacity to recognize and take advantage of chances for adopting new technologies (Gao et al., 2023; Kurniasari et al., 2023). Technology adoption has a significant influence on the financial aspects of companies, as it facilitates access to funding sources that play a crucial role in sustaining innovative capability (Hahn et al., 2017).

Utilizing financial technology platforms by MSMEs can significantly contribute to facilitating organizations' access to finance, hence enhancing their performance and sustainability (Arner et al., 2020). Financial reports offer data on the assets, capital, income, costs, and financial status of MSMEs (Hastuti et al., 2021). According to Kurniasari et al. (2023), MSMEs who use technology into their financial activities would have favorable financial outcomes. By enabling MSMEs to obtain finance, they will be able to seize the chance to expand their markets, enhance their production capacity, and bolster their financial resources (Huston, 2010). Companies can enhance their financial performance and make more accurate financial judgments by leveraging information technology assistance and investment opportunities (Hastuti et al., 2021). Increased access to capital, investors, and payments by an organization leads to a larger level of digital adoption, which in turn enhances the efficiency and innovation of MSMEs (Kurniasari et al., 2023). Additionally, their research indicates that the implementation of financial literacy through the use of digital technology will increase the accessibility of MSME funding, thereby allowing MSMEs to select the most appropriate financing source. Their research also verified that digital adoption has the potential to enhance the financial performance of MSMEs. According to this information, this study can derive the following hypothesis:

H2: Digital technology adoption positively and significantly influences the MSMEs' financial performance.

4. Digital Transformational Leadership and Digital Technology Adoption

In terms of the operation of businesses and the enhancement of more interactive

relationships, technological advancements have had a significant impact on society, business, and organizations (Bresciani et al., 2021). Digital transformation is an essential requirement for organizations and businesses worldwide to enhance their performance through the implementation of digital technology (Luu, 2023). A shift in planned activities that is based on advanced technology and results in tangible changes in the production of solutions and concepts is the hallmark of digital transformation (Saarikko et al., 2020). Organizations may be motivated to implement a variety of digital components, including big data, analytics, cloud computing, mobile communication technology, and various social media platforms, in order to formulate strategies or market products or services (Bresciani et al., 2021; AlNuaimi et al., 2022). The three primary components of digital transformation in its application are the ability to assess and redesign organizational strategy, open feedback and participation from the wider community, and the ability to adapt and meet diverse customer needs. These elements can increase organizational collaboration and innovation, shape image, value, and brand proposition (AlNuaimi et al., 2022). In this instance, the role of leadership is regarded as a critical element in the establishment of organizational values and beliefs regarding the use of digital technology in order to accomplish successful digital transformation (Weber et al., 2022).

Digital transformation leadership refers to the actions taken by leaders to support the successful implementation of strategic digitalization in businesses and organizations. This definition has been widely interpreted and discussed by various researchers (AlNuaimi et al., 2022; McCarthy et al., 2022; Schiuma et al., 2022; Majumdarr et al., 2024). Leadership is widely recognized as a crucial factor in shaping and upholding organizational ideals that foster innovation inside firms. Leaders in businesses are responsible for developing a new vision and executing transformation strategies to promote digital transformation, which aims to explore new opportunities, enhance productivity, and enhance employee performance (Philip, 2021; Luu, 2023). Organizational leadership plays a crucial role in enabling an organization to adapt to digital transformation. This highlights the fact that elements such as culture, leadership, and organizational dynamics have a substantial impact on the successful adoption of technology (Philip, 2021). Applying technology includes not only the utilization of new technology, but also significant modifications to the organization's operations and methods of providing products or services to clients (Chierici et al., 2021). Leaders in this scenario must possess the ability to motivate organizations to prioritize the establishment of new businesses and the growth of current ones by making digital transformation the primary strategy for generating value for the company (Schiuma et al., 2022).

Alaloul et al. (2020) highlighted the significance of digital technology as a crucial factor in enhancing organizational efficiency. Given the complexity and quick evolution of information technology, it is crucial to enhance the adoption of digital technology through the process of transferring trust (Skare and Soriano, 2021). The process of transferring trust can be accomplished by facilitating the real-time exchange of information, ensuring transparency, and fostering greater contact between consumers and suppliers through the use of digital technologies (Wang et al., 2020). The success of digital technology adoption is evident through the effective implementation of Industry 4.0, which encompasses the utilization of various technologies such as the Internet of Things (IoT), robotics, 3D printing, off-site manufacturing, blockchain, cyber-physical

systems, social media, and other advanced technologies (Sepasgozar, 2020). Organizations rely on technology as the basis for introducing their products and services, which necessitates human resources with advanced skills and competencies (Goduscheit and Faullant, 2018). Organizations can enhance their competitiveness, improve the efficiency of product development and commercialization, and assess consumer requirements to develop innovative products and services by providing high-quality services (Blichfeldt and Faullant, 2021).

Within the realm of MSMEs, the effectiveness of technology implementation is measured by the organization's capacity to utilize technology in different stages of development and long-term viability (Prause, 2019). MSMEs have experienced significant transformations due to the adoption of digital business practices. These changes include improvements in business strategy and operations, enhanced customer service processes, and the utilization of online payment systems (Vrontis et al., 2022). Leaders have a vital role in recognizing the significance of digital transformation in promoting the advancement of MSMEs when it comes to comprehending the technology adoption process (Leso et al., 2023). Leaders who endorse novel principles in the implementation of digital technology will enhance the organization's receptiveness to change and foster comprehension of digital strategy (Hinings et al., 2018). According to Khalid et al (2023), leaders must possess a comprehensive understanding of emerging technological trends, ascertain the course of action for digital transformation and investment strategies, and effectively guide teams through swift and suitable changes. Hence, the adoption of digital technology in an organization is closely associated with the role of leadership. By adopting digital technology that suits organizational needs, service efficiency, effectiveness, and accountability will be increased (David et al., 2023). From this description, this study formulates the following hypothesis:

H3: Digital transformational leadership positively and significantly influences the MSMEs' digital technology adoption.

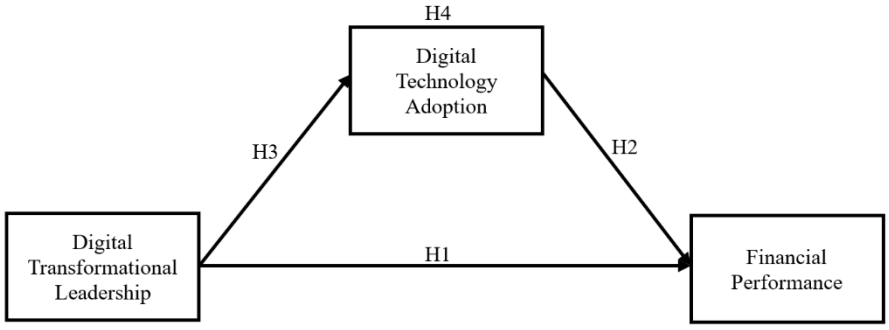
5. The Mediating Relationship

The concept of leadership in driving organizational success has been widely discussed in prior research (Farahnak et al., 2019; Akdere and Egan, 2020; Odeh et al., 2023). The success of an organization is influenced by the crucial role of leaders in managing the company, fostering organizational resilience, and impacting sustainable business development through social means (Schlosser et al., 2023; Permana et al., 2024). The leadership role is not solely concerned with the attainment of organizational objectives; it also emphasizes the process, which is the organization's primary objective in accomplishing its objectives. A leader's capacity to motivate an organization to prioritize the implementation of digital technology can significantly enhance its overall performance (AlNuaimi et al., 2022). The integration of digital technology can lead to alterations in the decision-making process, which serves as the foundation for organizations' endeavors to enhance the financial performance of the company (Zhang et al., 2023). However, RBV suggests that higher-order managerial capabilities influence performance primarily through the development of lower-order operational capabilities that convert resources into value. According to Gun et al. (2024), transformational leadership and employee self-efficacy have a significant influence in the process of

digital transformation. Ultimately, digital transformation will enhance the company's operational and financial performance, whether it be through direct means or indirectly, by mitigating the effects of environmental uncertainty. The organization's success in leveraging digital technologies to boost revenue will be determined by its financial performance, as indicated by financial reports (Arner et al., 2020). Son et al. (2020) found that organizational performance is impacted by the capacity of transformational leadership to engage and inspire individuals, leading to improved performance. Currently, there is limited research available that explores the intermediary function of digital technology adoption in the context of digital transformation leadership and its impact on financial success. Understanding the role of leaders in implementing digital technology to meet firm financial performance goals, particularly for MSMEs, poses a significant issue. Thus, to comprehend the notion of the mediation relationship, the subsequent hypothesis is put forward:

H4: Digital technology adoption positively and significantly mediates the relationship between digital transformational leadership and MSMEs' financial performance.

Figure 1
Proposed Research Model



III. METHODOLOGY

A. Data Collection and Procedures

This research examines the empirical relationships among digital transformational leadership, digital technology adoption, and financial performance in Indonesian MSMEs using a quantitative methodology. A cross-sectional survey was used to assess MSME employees' perceptions of leadership behaviors, current levels of digital technology adoption, and recent financial performance over a specified timeframe. This design is frequently employed in organizational and MSME research (Senadjki et al., 2024; Asbeetah et al., 2025) to conduct preliminary assessments of theoretically hypothesized relationships in contexts where acquiring longitudinal financial and behavioral data is impeded by time, expense, and accessibility limitations. Nonetheless, the cross-sectional structure of the data constrains robust causal inference; thus, the findings are regarded as associational evidence aligned with the suggested capability-to-performance pathway

rather than conclusive causality. To test the proposed research model and examine both direct and mediating relationships among constructs, the study employed Partial Least Squares Structural Equation Modeling (PLS-SEM) using SmartPLS version 4, which is particularly suitable for theory development and prediction-oriented analysis in complex models involving latent variables and relatively small samples.

Given the substantial number of MSMEs in Indonesia, purposive sampling was employed to choose samples based on specific criteria. Specifically, participants were required to (1) be currently employed in an MSME in Indonesia, (2) be involved in or familiar with operational and technology-related activities, and (3) work in MSMEs that had adopted at least one form of digital technology in business processes. These MSMEs willingly completed the questionnaire over the period from March 2024 to May 2024. The sample size was determined using Hair's criteria, which required multiplying the number of questionnaire questions by ten to reach the minimal sample size (Hair et al., 2017). According to the results of the multiplication, the respondents gave a minimum of 140 respondents. Consequently, the report yielded a total of 178 questionnaires disseminated, above the minimum required quantity. After thorough deliberation, the choice was made to distribute questionnaires that had been modified to suit the research setting. This decision was based on careful evaluation of the research goals, the specific characteristics of the target population, and relevant prior studies (AlNuaimi et al., 2022; Gun et al., 2024). The demographic breakdown of the respondents reveals that 53.33% are male, 46.67% are female, 22% were aged <30, 73.33% were aged 31 - 50, and 4.67% were aged >50. Furthermore, 31.33% of the organizations are microbusinesses, 28% are small businesses, and 40.67% are medium businesses. The bulk of these organizations belong to the service sector (48.67%), while the remaining firms are from the trading sector (38%) and manufacturing sector (13.33%).

B. Measurement Instrument

The questionnaire consisted of two sections. The first section collected respondents' demographic information and firm characteristics. The second section measured the study constructs, namely digital transformational leadership, digital technology adoption, and financial performance. All measurement items were adapted from established prior studies and contextually adjusted to fit the Indonesian MSME setting. 14 items serve as the measurement aspects of this research. Every item from every construct is derived from prior research and adjusted to fit the specific research setting. There are six components for digital transformational leadership derived from (Chen & Chang, 2013). The utilization of digital technology is facilitated by five components established by Ritz et al. (2019). Four items, devised by Agyabeng-Mensah et al. (2020), were employed to assess financial performance. A 5-point Likert scale was employed to measure each topic on the questionnaire, with 1 representing "Strongly Disagree" and 5 representing "Strongly Agree".

Moreover, to improve instrument rigor, the modified items were evaluated to confirm conceptual alignment with the original scales and contextual appropriateness for MSME respondents. Procedural remedies were implemented to mitigate potential common method bias, including ensuring anonymity, highlighting the absence of correct or incorrect answers, and structuring the questionnaire into distinctly separated construct blocks. During the analysis phase, the measurement model was assessed in accordance

with PLS-SEM protocols by examining indicator loadings, internal consistency reliability (Cronbach's Alpha and Composite Reliability), convergent validity (Average Variance Extracted), and discriminant validity evaluation (Hair et al., 2017). Furthermore, common method bias was evaluated utilizing the complete collinearity variance inflation factor methodology, wherein full collinearity VIF values within the suggested level suggest that common method bias is improbable to compromise the validity of the findings.

IV. RESULTS AND DISCUSSION

A. Results

1. Measurement Model Assessment

The Structural Equation Modeling (SEM) method is employed to examine and assess the study model to accomplish research objectives. The use of SEM is often regarded as a thorough and efficient approach to validating the connection between latent variables in research. Similarly, this study favors the use of PLS-SEM instead of covariance-based testing due to its superior accuracy in evaluating non-parametric studies and novel research (Henseler et al., 2016), as well as its ability to examine the intricacies that come from current theories (Hair et al., 2019). The research method analysis consists of two steps, namely the evaluation of the measurement model and the evaluation of the structural model. The examination of the measuring model is the first step in the analysis process, which examines the validity and reliability of research indicators. The assessment of validity and reliability involves evaluating factor loading values that exceed 0.7, Average Variance Extracted (AVE) values that surpass 0.5, as well as Cronbach's Alpha (CA) and Composite Reliability (CR) values that reach or exceed the threshold of 0.7 (Hair et al., 2017). In order to ensure that all indications possess a high level of reliability. Subsequently, an assessment of discriminant validity was conducted by examining the square roots of the Average Variance Extracted (AVE) value. According to (Fornell & Larcker, 1981), for discriminant validity to be established, the AVE value must exceed the inter-construct correlation value. Next, the Heterotrait-Monotrait (HTMT) measure is employed to assess discriminant validity. This is done by examining whether the HTMT value is less than or equal to 0.85, which indicates a strong level of discriminant validity (Henseler et al., 2015). Additionally, a structural model test was conducted to evaluate the relationship between each variable. This is achieved by assessing the R^2 value to be over 0.1. According to Falk & Miller (1992), the structural model is considered viable if the R^2 value is higher than 0.1 or approaching 1. Subsequently, model fit criteria are employed to conduct hypothesis testing. The meeting criteria for the Standardized Root Mean Square Residual (SRMR) value are when it is below 0.05 or 0.08 (Hu & Bentler, 1999). The normed-fit index (NFI) is deemed satisfactory when it attains a value of 0.95 (Hu & Bentler, 1999). The findings indicate that the NFI is 0.840, indicating that the value fulfills the prescribed requirements.

Table 2
Construct Validity and Internal Consistency

Constructs	Loadings
Digital Transformational Leadership (Cronbach's Alpha = 0.917; CR = 0.938; AVE = 0.751)	
DTL 1	0.893
DTL 2	0.865
DTL 3	0.890
DTL 4	0.885
DTL 5	0.796
Digital Technology Adoption (Cronbach's Alpha = 0.880; CR = 0.914; AVE = 0.683)	
DTA 1	0.609
DTA 2	0.878
DTA 3	0.906
DTA 4	0.874
DTA 5	0.830
Financial Performance (Cronbach's Alpha = 0.901; CR = 0.938; AVE = 0.835)	
FP 1	0.896
FP 3	0.933
FP4	0.911

Note: DTL5 and FP2 were eliminated due to being unable to meet the required thresholds

Table 3
Discriminant Validity

Fornell-Larcker Criterion			
	DTA	DTL	FP
DTA	0.826		
DTL	0.523	0.866	
FP	0.436	0.494	0.914
HTMT			
DTA	-		
DTL	0.571	-	
FP	0.485	0.542	-

Table 4
Cross Loading Matrix

	DTL	DTA	FP
DTL1	0.893	0.482	0.442
DTL2	0.865	0.457	0.467
DTL3	0.890	0.499	0.427
DTL4	0.885	0.434	0.379
DTL5	0.796	0.382	0.419
DTA1	0.271	0.609	0.244
DTA2	0.495	0.878	0.390
DTA3	0.514	0.906	0.400
DTA4	0.426	0.874	0.403
DTA5	0.407	0.830	0.337
FP1	0.464	0.413	0.896
FP3	0.445	0.412	0.933
FP4	0.443	0.368	0.911

2. Multicollinearity

Variance inflation factors (VIF) were computed to verify collinearity, and all constructs were subjected to multicollinearity testing previously. Hair et al. (2011) assert that PLS-SEM necessitates a VIF tolerance value of less than 5, and multicollinearity will arise if the VIF exceeds 5. They recommend that items that result in VIF values exceeding 5 should be eradicated. The results indicate that the VIF value of FP2 exceeds the specified value. Consequently, in order to attain optimal multicollinearity values, item FP2 was eliminated.

3. Structural Model Assessment

The structural model assessment was conducted after the validity and reliability of the concept were established. Initially, the model's quality is assessed in terms of its ability to predict endogenous constructs. It is then accessible using the coefficient of determination (R^2), path coefficient (β), and path significance. The standardized path coefficient evaluates the degree to which the hypothesis is supported. The quality of the model is ultimately assessed based on the robustness of each structural path (Gallardo-Vázquez and Sánchez-Hernández, 2014).

Falk and Miller (1992) state that the R2 value of the latent dependent variable for each path between components should be 0.1 or higher, indicating predictive power in the model. Similarly, R^2 values of 0.75, 0.50, or 0.25 for an internal hidden variable might be regarded as significant, moderate, or weak (Henseler et al., 2009; Hair et al., 2011). The results demonstrate that the R^2 values for DTA and FP are both 0.273 and 0.288, respectively. These values are deemed to be of moderate magnitude.

To prevent model specification mistakes, it is recommended to utilize the standardized root mean square residual (SRMR) in PLS-SEM (Henseler et al., 2016). Hu and Bentler (1999) define SRMR as the standardized discrepancy between observed and expected correlations. Accordingly, the adequacy of the global model was assessed by employing the SRMR measure (Ly and Ly, 2022). Nevertheless, there has not been any suggested SRMR threshold specifically for PLS-SEM in the study conducted by (Hair et al., 2017). Thus, it is recommended that a model with an SRMR value less than 0.10 is considered appropriate (Hu and Bentler, 1999; Worthington and Whittaker, 2006). The SRMR value of 0.06 suggests that this research has a strong model fit.

Additional evaluations of the adequacy of the model and hypotheses are conducted to ascertain the importance of the association. In addition, the replacement approach was employed to generate 5000 bootstrap samples in order to assess the importance of each path coefficient. According to the data presented in Table 5, all path coefficients exhibit statistical significance. The results indicate that DTL ($\beta = 0.366$; $t = 4.878$) and DTA ($\beta = 0.245$; $t = 3.516$) have a statistically significant and favorable impact on FP. Therefore, H1 and H2 are strongly supported. Furthermore, the variable DTL ($\beta = 0.523$; $t = 7.261$) has a notable and statistically significant effect on DTA. Thus, H3 is corroborated.

4. The Mediating Analysis

Zhao et al. (2010) recommend that to investigate mediation effects in PLS, it is necessary to first measure indirect effects. Next, ascertain the quantity of mediation. The empirical

results indicate that the overall impact is both statistically significant and positive (β = 0.494; t = 7.593). After incorporating the mediating relationship into the model, its impact decreased, and the direct relationship became statistically significant (β = 0.366; t = 4.878). Additionally, the indirect effect, including the mediator, was also found to be statistically significant (β = 0.128; t = 3.368). Thus, there is considerable evidence in favor of H_4. Therefore, the results of this study suggest that DTA has a role in mediating the relationship in the model.

Figure 2
Structural Model Results

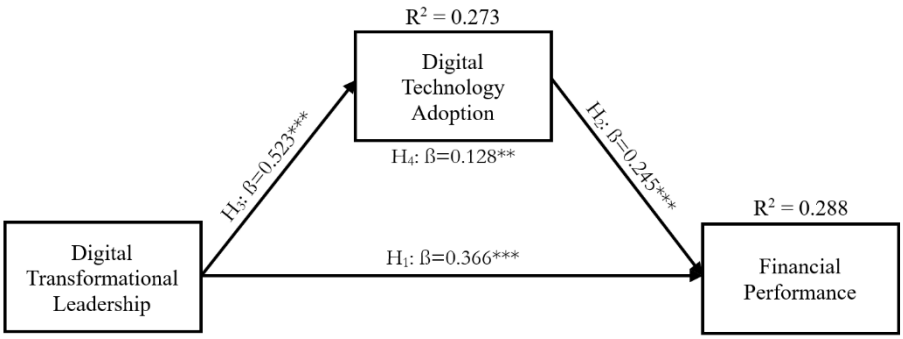


Table 5
Summary of Hypotheses Results

Causal Relationship	Path Coefficients	t-Value	p-Value	Conclusion
	Direct			
H_1: DTL→FP	0.366	4.878	0.000	Accepted
H_2: DTA→FP	0.245	3.516	0.000	Accepted
H_3: DTL→DTA	0.523	7.261	0.000	Accepted
	Mediation			
H_4: DTL → DTA → FP	0.128	3.368	0.001	Accepted

B. Discussion

The objective of this study is to examine the correlation and impact of digital transformational leadership on promoting the use of digital technology, leading to enhanced financial performance of MSMEs, with digital technology adoption serving as a mediator. The results of this study provide support for the proposed hypothesis, which is based on the identified relationships between the variables. The findings indicate that digital transformational leadership has the ability to stimulate enhancements in the financial performance of MSMEs. From a resource-based view (RBV) perspective, this finding suggests that digital transformational leadership functions as a higher-order managerial capability that enables MSMEs to mobilize, integrate, and reconfigure limited internal resources to create value under conditions of digital transformation (Abdurrahman, 2025). These findings align with previous research, indicating that in the age of digital transformation, digital transformational leadership effectively oversees and motivates firms to compete successfully by embracing and utilizing digital technology.

In addition, digital transformational leadership possesses the ability to establish effective digitalization strategies and objectives in order to adapt new business models in response to prevailing circumstances. Such strategic alignment strengthens firm-specific routines and decision processes that underpin financial performance, particularly when MSMEs face constraints in capital, skills, and formal structures. Digital transformational leadership can adopt digital principles and modify its convictions to assist organizations undergoing changes, enabling them to enhance their performance in the digital transformation era, particularly in terms of financial performance (Hinings et al., 2018). Thus, to foster a competitive edge and relevance in the context of Industry 4.0, it is imperative for MSMEs to have leaders who actively promote the digitization process in their business operations (Chang et al., 2023).

Moreover, the implementation of digital technology has a beneficial and substantial impact on enhancing financial performance. Multiple studies have demonstrated that firms have experienced significant advantages from implementing digital technologies (Abou-foul et al., 2021; Tsou and Chen, 2023; Dhiaf et al., 2024). This demonstrates that the use of digital technology in businesses can enhance corporate operational efficiency, decrease operational expenses, and broaden market reach. The present findings reinforce the argument that technology contributes to financial outcomes when it is embedded as an operational capability and integrated into core processes, rather than treated as a standalone technological asset. Hence, the incorporation of digital technology is crucial in promoting enhanced organizational performance. Kurdi et al. (2023) suggest that for organizations to enhance their performance during the era of digital transformation, they must be capable of integrating digital technology into their business operations.

Furthermore, the results demonstrate that digital transformational leadership exerts a substantial and favorable impact on the adoption of digital technology. The findings of this study corroborate prior research that emphasizes the significance of digital transformational leadership in facilitating the adoption of digital technology (AlNuaimi et al., 2022). This is achieved through the establishment of a clear vision, motivation of employees, cultivation of digital skills, promotion of innovation, utilization of data for decision-making, and establishment of strategic partnerships (AlNuaimi et al., 2022; Ly, 2023). This relationship highlights that technology adoption is not merely a technical decision but a capability-building process shaped by leadership through the alignment of human resources, technological tools, and organizational priorities. Hence, digital transformational leadership has the ability to motivate and direct individuals of a company to embrace and execute the adoption of new technology.

Eventually, these results demonstrate that the relationship between digital transformational leadership and financial performance is mediated by the adoption of digital technology. This mediation effect clarifies the mechanism through which leadership translates into financial outcomes, namely through the deployment of technology-related operational capabilities that convert digital resources into economic value. This indicates that MSME sector organizations in developing countries, such as Indonesia, should prioritize the adoption of digital technology to ensure that their performance is relevant to the digital era. This is due to the fact that digital transformational leadership may not produce the desired outcomes in improving the performance of MSME's when dealing with the digital transformation era in the absence of digital technology implementation. In addition, the enhancement of an organization's

financial performance is contingent upon the implementation of new digital technologies to generate added value for MSMEs. This is achieved by optimizing new business strategies, including digital marketing, technology-based services, market expansion, customer comprehension through analytical data, and business operational efficiency. Accordingly, digital technology adoption functions as the central transmission mechanism linking leadership-driven capability development to measurable financial performance outcomes in MSMEs.

V. CONCLUSION

A. Theoretical and Practical Implications

This study provides empirical evidence that elucidates the correlation between digital transformational leadership, digital technology adoption, and financial performance in micro, small, and medium-sized enterprises (MSMEs) in Indonesia. Research indicates that in the context of organizational change, the presence of robust relationships allows digital transformational leadership to effectively influence the adoption of digital technology and subsequently improve financial performance. In addition, organizations can derive advantages from possessing digital transformational leadership, which promotes the integration of digital technology to enable swift and accurate responses to the evolving digital landscape. This, in turn, fosters enhancements in overall organizational performance, with a particular emphasis on the financial performance of MSMEs.

From the theoretical perspective, this study enhances the literature on digital transformation and MSMEs by elucidating the interaction between leadership and technology that affects performance. The findings indicate that financial enhancement occurs when leadership-driven organizational capabilities are converted into operational capabilities, especially via the systematic incorporation of digital technology. By highlighting this capability-oriented approach, the study transcends direct-effect interpretations and provides a more sophisticated comprehension of how MSMEs create value in resource-constrained environments.

Practically, the findings indicate that MSME proprietors and managers should prioritize leadership behaviors that foster digital capability growth, rather than concentrating exclusively on technology acquisition. Investments in digital technologies are more likely to generate financial returns when supported by explicit strategic direction, employee involvement, and coherence between technology and business processes. Policymakers and support institutions can improve MSME performance by augmenting digital infrastructure investments with leadership development programs that boost enterprises' ability to implement and utilize digital technology effectively.

Moreover, this study offers a valuable understanding of how organizational behavior influences the performance of MSMEs during the digital transformation age. This highlights the role of digital transformational leadership in promoting the use of digital technology to enhance the financial performance of an organization. Furthermore, this contributes to knowledge by investigating the correlation between digital transformational leadership, digital technology adoption, and organizational success. This greatly adds to the ongoing research trend for Micro, Small, and Medium Enterprises (MSMEs) to revamp and reconstruct new business strategies in order to enhance

organizational performance.

B. Limitation and Future Direction

While this paper has yielded promising outcomes, it is important to highlight its various limitations. Initially, this study was carried out on a limited number of MSME sector firms in Indonesia. In future studies, it would be beneficial to obtain larger samples exclusively from the MSME sector in other developing nations. Furthermore, this study is constrained by many elements that have the potential to impact financial performance. Subsequent studies may explore additional variables that have been recently mentioned but were not considered in this work, such as digital strategy (AlNuaimi et al., 2022), knowledge management (Machado et al., 2022), and innovation (Peng & Tao, 2022). Finally, we employed a cross-sectional research design to evaluate the overall hypotheses in this study. However, as the digital technology field progresses, there will be chances for future research to utilize longitudinal data on the implementation process (AlNuaimi et al., 2022) and conduct a more in-depth analysis of the performance of MSMEs in digital transformation. Hence, in the future, longitudinal studies may be employed to assess the durability and execution of digital transformation over an extended period.

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