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DIGITAL TRANSFORMATION, SUSTAINABILITY, AND MSME PERFORMANCE: THE ROLE OF ORGANIZATIONAL AGILITY

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Abstract- Micro, small, and medium-sized businesses (MSMBs) in the modern digital age are under increasing pressure to innovate and adapt to the ever-shifting demands of consumers. Keeping up with the competition and remaining relevant in the market now requires digital transformation for MSMEs. This study's overarching goal is to learn how digital transformation has affected the efficiency and productivity of micro, small, and medium-sized enterprises (MSMEs) in Central Java, and how sustainability practices have played a key role in their meteoric rise to the top. Sales growth, market reach, and customer happiness are some of the main performance factors that this study aims to understand through the application of digital tools and sustainable practices. In this study, quantitative research methods were employed. The total sample is 221 respondents. Purposive random sampling is the method used for sampling. Analysis of variance in this research makes use of SEM-PLS, or Structural Equation Modeling with Partial Least Squares. According to the findings, digital transformation has a beneficial impact on the performance and agility of micro, small, and medium-sized enterprises (MSME), and business sustainability also directly affects these metrics. Mediating the relationship between corporate sustainability and MSME performance, organizational agility was determined to be an important factor in increasing the efficacy of sustainable strategies. It appears that digital transformation may have an immediate effect on MSME performance independent of organizational agility, as the null hypothesis stating that agility mediates the connection between the two was not borne out.

Keywords: Digital Transformation; Business Sustainability; Organizational Agility; MSME performance

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1. INTRODUCTION

1.1 Background

Micro, small, and medium-sized firms (MSMEs) in the modern digital age are pressured to innovate and adapt due to the fast changes in consumer tastes and technology (Krishen et al., 2021). Keeping up with the competition and remaining relevant in the market now requires digital transformation for MSMEs. According to Hendricks and Mwapwele (2024), digital transformation is more than just digitizing procedures; it entails a sea change in the ways that micro, small, and medium-sized enterprises (MSMEs) engage with clients, oversee operations, and create new goods and services. Using e-commerce, social media, and other digital

platforms, MSMEs can increase their efficiency and attract a wider audience. Despite the many benefits that may be gained from embracing technology, not all micro, small, and medium-sized enterprises (MSMEs) are equipped to make the most of this transition (Gupta & Patil, 2020).

Nowadays, many MSMEs are more worried about the long-term viability of their businesses than they are about digital transformation. More and more, people are realizing that social and environmental factors are just as important to a company's long-term success as financial ones (Kraiwanit et al., 2023). Sustainable business practices for micro, small, and medium-sized enterprises (MSMEs) include making a positive influence on society and the environment while simultaneously making a profit. Many micro, small, and medium-sized enterprises (MSMEs) are starting to do things the right way, like being socially active, using local suppliers, or being more eco-conscious. As a result, they gain credibility and the devotion of customers who are concerned about environmental issues (Kumar & Sharma, 2022).

Nevertheless, there are times when digital transformation and company sustainability are not easily implemented in MSMEs. According to Mikalef et al. (2023), there are numerous obstacles to overcome, such as a lack of digital expertise, limited resources, and the inability to respond rapidly to new situations. In order to tackle these difficulties, the ability for organizations to be agile is crucial. The capacity of micro, small, and medium-sized enterprises (MSMEs) to respond swiftly and nimbly to shifts in technology or customer preferences is known as organizational agility. The ability to swiftly detect and react to changes allows highly agile organizations to make the most of new possibilities and protect themselves from danger (Kumar & Sharma, 2022). When considering the effects of digital transformation and company sustainability on the performance of MSMEs, organizational agility emerges as a critical component. According to Sharma et al. (2020), small and medium-sized enterprises (SMEs) that possess a high degree of agility are more equipped to adapt to the ever-changing digital business landscape. Innovation can be embraced and plans can be adjusted more swiftly to meet market demands. When micro, small, and medium-sized enterprises (MSMEs) have this capacity for adaptation, digital transformation and long-term company viability can produce better results, especially in enhancing company performance, which includes things like sales, customer loyalty, and competitiveness in the market. In contrast, digital transformation and sustainability initiatives could fall short of expectations if organizations lack the necessary adaptability (Behera et al., 2024).

Conversely, customer tastes are shifting toward favoring technologically innovative and ethically operating enterprises, which drives the demand for technological adaption and company sustainability among MSMEs (Singh, 2024). People nowadays are more likely to do business with brands that care about the community and the environment in addition to providing digital conveniences and efficiency. Small and medium-sized enterprises (SMEs) that effectively integrate digital transformation with sustainability initiatives will have a leg up when competing for the attention of discerning modern consumers. According to Baumüller et al. (2023), this has a favorable effect on the company's image and contributes to improved long-term success by strengthening consumer loyalty. As they attempt to maintain a competitive edge in the digital age, micro, small, and medium companies (MSMEs) in Central Java encounter considerable obstacles. Adapting to rapid technological changes is a challenge for many MSMEs, even if they have the capacity to grow and make a big impact on the region's economy. It is difficult for these companies to successfully use digital platforms and solutions due to low levels of digital literacy, insufficient infrastructure, and limited resources (Wilendra et al., 2024). Their capacity to get into more markets, interact with contemporary customers, and maximize operational efficiency is hampered by their reluctance to embrace digital change.

In addition, many micro, small, and medium-sized enterprises (MSMEs) are in a precarious position when it comes to digital strategy implementation due to a lack of expertise and funding (Peethambaran & Naim, 2024).

Data from the past few years suggests that very few micro, small, and medium-sized enterprises (MSMEs) in Central Java have completely embraced digital marketing tactics and tools, with just about 30% having done so. When asked about the biggest obstacles to digital transformation, many MSMEs mentioned a lack of knowledge (about 45%) and low financial resources (about 60%). Furthermore, studies show that only around a quarter of these companies really put sustainability strategies into action, mostly because people are confused about the advantages and the costs of going green. Particularly as customer tastes move toward more environmentally conscious and technologically sophisticated brands, these constraints make it harder for them to compete and grow their market share. To help the micro, small, and medium-sized enterprises (MSMEs) in Central Java close these gaps, this data highlights the critical need for focused assistance and funding (Wibowo & Yulianto, 2022).

The rising need for sustainable business practices is another problem that makes these difficulties worse. Businesses that show they care about social concerns and the environment tend to attract more environmentally conscious and socially conscious consumers (Hasibuan et al., 2024). But many Central Javan MSMEs don't have the capital or the right strategies to make sustainability part of their business model. Their capacity to satisfy the rising expectations of socially concerned consumers is diminished, and this constraint impacts both their brand image and market reach. Therefore, there is an urgent need for assistance and guidance in digital transformation and sustainability programs for micro, small, and medium-sized enterprises (MSMEs) in Central Java, since they frequently struggle to meet the changing needs of today's market (Hassan et al., 2022). This study provides a fresh viewpoint by investigating the moderating role of organizational agility in the relationship between digital transformation, company sustainability, and MSME performance in Central Java. This study combines digital adoption and sustainability to learn how the two aspects affect micro, small, and medium-sized enterprises (MSMEs) together, rather than just one or the other. The study takes a step toward filling a gap in the literature by incorporating organizational agility as a moderating variable. This variable helps to enhance the impact of digital and sustainable practices on company results, which has been understudied before (Ahuja & Khazanchi, 2016). In today's dynamic business environment, when small and medium-sized enterprises (SMEs) are under constant pressure to embrace new technology, implement sustainable practices, and respond quickly to changes in the market, this strategy is more important than ever. This research adds to our knowledge of how micro, small, and medium-sized enterprises (MSMEs) in Central Java may strengthen their resilience and competitiveness through the use of digital and sustainable methods (Andreopoulou et al., 2014).

Resource-Based Theory (RBT) is the theoretical foundation of this study. According to RBT, a company's competitive advantage comes from its special, uncommon, valuable, inimitable, and non-substitutable resources and skills (Cohen & Levinthal, 1990). Strategic resources that, when used properly, can improve MSME performance include digital transformation and company sustainability, according to this research. In this context, RBT shines because of its focus on in-house resources—including digital technologies and sustainable practices—as drivers of long-term value creation and competitive advantage. To further maximize their influence, MSMEs can change and reorganize these resources in response to market demands thanks to organizational agility, a dynamic skill. This study applies RBT to investigate how micro, small, and medium-sized enterprises (MSMEs) in Central Java may gain and maintain a competitive advantage through the use of digital and sustainable

practices. This is particularly important in today's dynamic business climate, where the ability to change quickly is paramount (Cohen & Levinthal, 1990).

This study's overarching goal is to learn how digital transformation has affected the efficiency and productivity of micro, small, and medium-sized enterprises (MSMEs) in Central Java, and how sustainability practices have played a key role in their meteoric rise to the top. Sales growth, market reach, and customer happiness are some of the main performance factors that this study aims to understand through application of digital tools and sustainable practices. The study also intends to look at how organizational agility acts as a moderator, specifically at how micro, small, and medium-sized enterprises (MSMEs) are able to respond swiftly to changes in the market and how this strengthens the connection between digital transformation, sustainability, and company performance. This research aims to provide valuable insights into how MSMEs in Central Java can improve their competitiveness and resilience in an increasingly dynamic business environment by analyzing these interconnected factors. Specifically, it will focus on digital technologies, sustainable practices, and organizational agility.

Literature Review

1.2.1 Digital Transformation in MSMEs

Digital transformation refers to the integration of digital technologies into all areas of business, fundamentally changing how companies operate and deliver value to customers (Shams et al., 2024). For MSMEs, digital transformation encompasses the adoption of tools such as e-commerce platforms, social media marketing, cloud computing, and data analytics, which allow businesses to streamline operations, enhance customer engagement, and reach wider markets (Esfahbodi et al., 2022). Research has shown that digital transformation not only improves efficiency but also enhances the competitiveness of MSMEs by enabling them to innovate and provide better services (Mukhopadhyay, 2023). In particular, the use of digital marketing strategies through platforms like social media can help MSMEs build brand awareness, engage directly with consumers, and drive sales growth, offering them opportunities to compete with larger enterprises in a digital-first market (Cassia & Magno, 2022).

The adoption of digital tools significantly impacts MSME performance by enabling them to reduce operational costs, improve efficiency, and expand market reach. Digitalization provides MSMEs with greater access to data-driven insights, helping them make more informed decisions regarding product offerings, customer preferences, and market trends (Shankar et al., 2022). This allows businesses to align their strategies with current consumer demands and optimize their operations for better performance. As digital technologies evolve, MSMEs that embrace these tools can enhance their competitiveness, streamline internal processes, and improve customer service, which ultimately contributes to higher profitability and growth (Pandey et al., 2020). Moreover, digital transformation supports better customer engagement by offering personalized experiences, enhancing customer satisfaction, and fostering loyalty, which are critical drivers of sustained business performance.

In addition to its direct impact on performance, digital transformation is closely linked to organizational agility, which plays a critical role in how MSMEs respond to changes in the business environment. Organizational agility refers to a firm's ability to rapidly adapt to changes, whether through new technological advancements or shifting market conditions (Giotopoulos et al., 2022). For MSMEs, being agile in adopting new digital tools allows them to quickly pivot their business models, explore new revenue streams, and stay relevant in a fast-evolving market. Digital transformation, when combined with organizational agility,

enables MSMEs to remain flexible and responsive to external challenges, ensuring they can leverage new technologies to improve performance while maintaining a competitive edge. This synergy between digital transformation and agility is especially important in today's dynamic business environment, where the ability to adapt quickly to digital trends and consumer expectations is a key factor in MSME success (Diaz et al., 2022).

³ H1: Digital transformation has a positive influence on MSME Performance

H2: Digital transformation has a positive influence on Organizational Agility

¹⁴ 1.2.2 Business Sustainability

Business sustainability refers to the ability of a company to operate in a way that meets the needs of the present without compromising the ability of future generations to meet their own needs. In the context of MSMEs, sustainability encompasses economic, social, and environmental dimensions. MSMEs that embrace sustainable practices, such as reducing waste, supporting local communities, and adopting eco-friendly processes, often gain a competitive edge by appealing to socially conscious consumers and enhancing their reputation (Fitriani et al., 2023). Studies have shown that sustainable business practices not only improve a company's long-term viability but also contribute to its overall performance by fostering customer loyalty and brand differentiation (Martini et al., 2023). The adoption of sustainability practices, particularly in MSMEs, helps address growing consumer demand for ethical products and services, thus opening new market opportunities and enhancing business resilience (Zahoor & Lew, 2023).

Sustainability can directly influence MSME performance by improving brand image and customer loyalty. As consumers become more socially and environmentally conscious, businesses that align with sustainable practices are more likely to attract and retain customers, thus increasing sales and profitability. Research by (R. R. Hasibuan et al., 2024) suggests that sustainability initiatives, such as reducing carbon footprints or implementing sustainable sourcing, can differentiate MSMEs from competitors, providing them with a unique value proposition that enhances their market position. Furthermore, MSMEs that adopt sustainability practices often enjoy improved operational efficiency due to resource optimization and waste reduction, leading to cost savings and increased profitability. Thus, sustainability not only helps MSMEs meet regulatory and ethical standards but also contributes to their bottom line, making it a critical driver of business success (Shukla et al., 2024).

In relation to organizational agility, sustainability practices are often intertwined with a company's ability to adapt and innovate in response to shifting market demands. Organizational agility allows MSMEs to integrate sustainable practices more effectively by being able to quickly modify their operations and strategies in response to consumer preferences, environmental regulations, or market shifts (Vangeli et al., 2023). For instance, an agile MSME can rapidly pivot its business model to adopt new sustainable technologies or launch eco-friendly product lines, capitalizing on emerging opportunities in the market. When combined with agility, sustainability initiatives enhance MSMEs' ability to respond proactively to both environmental and market changes, enabling them to remain competitive. The agility to innovate and implement sustainability practices swiftly can provide MSMEs with a significant advantage, leading to improved performance and long-term resilience. This adaptability is crucial in an era where sustainability is becoming increasingly important to consumers and regulators alike (Ballerini et al., 2023).

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H3: Business sustainability has a positive effect on MSME Performance

H4: Business sustainability has a positive effect on Organizational Agility

1.2.3 ⁸ Organizational Agility

Organizational agility refers to the ability of a business to quickly adapt to changes in its environment, respond to new opportunities, and manage unforeseen challenges effectively (Gao & Xing, 2023). For MSMEs, organizational agility is particularly crucial in a volatile and competitive market, where rapid changes in consumer preferences, technology, and regulations can significantly impact business performance. Agile organizations are characterized by their ability to innovate, experiment, and adjust strategies swiftly in response to market dynamics (Bucciari & Park, 2022). Research by (Brewis et al., 2023) highlighted that agile organizations are better positioned to leverage digital transformation and sustainability initiatives, as they can adapt more easily to new technologies and consumer demands. In the case of MSMEs, organizational agility plays a moderating role by enabling firms to capitalize on the benefits of digital tools and sustainability practices while quickly adjusting their operations to maximize performance (Iyer & Bright, 2024).

⁴³ The importance of organizational agility becomes even more apparent when examining the relationship between digital transformation and MSME performance. In the digital era, MSMEs are increasingly adopting ²⁹ digital technologies to optimize operations and reach broader markets. However, the mere adoption of digital tools is not enough; organizations need to be agile to adapt these technologies effectively and make the most out of them (Mora Cortez & Hidalgo, 2022). For instance, MSMEs with high organizational agility can more quickly integrate new digital platforms, such as e-commerce, data analytics, or customer relationship management (CRM) tools, into their operations. This ability to swiftly adapt and scale digital initiatives allows them to optimize business performance, drive customer engagement, and improve decision-making. The synergy between digital transformation and organizational ¹⁰⁶ agility enables MSMEs to enhance their competitiveness, adapt to customer expectations, and ultimately improve performance metrics such as sales growth, market expansion, and customer loyalty (Saheb et al., 2021).

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Organizational agility also plays a key mediating role in the relationship between business sustainability and MSME performance (Johansson & Zhu, 2023). In today's business landscape, sustainability practices are increasingly vital, with both customers and regulators placing growing importance on ethical and environmentally-friendly business models. However, the success of these practices largely depends on how agile an organization is in implementing and adjusting sustainability ²⁶ initiatives (Da Silva et al., 2023). For MSMEs, organizational agility enables them to integrate sustainability into their operations more effectively and respond quickly to shifts in consumer demand for green products or services (Heriqbaldi et al., 2023). Agility in adopting sustainability initiatives, such as eco-friendly manufacturing processes, renewable energy use, or sustainable supply chain practices, can lead to improved operational efficiency, lower costs, and stronger customer loyalty. Consequently, businesses that are both sustainable and agile are better positioned to enhance their performance, as they can capitalize on sustainability-driven opportunities while remaining responsive to ⁴² market changes. This interconnectedness between agility, sustainability, and performance highlights the importance of a flexible organizational structure for MSMEs to thrive in the current market environment (Fuller et al., 2022).

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H5: Organizational agility has a positive effect on MSME performance.

H6: Organizational agility mediates the relationship between digital transformation and MSME Performance

H7: Organizational agility mediates the relationship between Business sustainability and MSME Performance

1.2.4 MSME Performance

MSME performance refers to the success and outcomes achieved by small and medium enterprises in terms of financial growth, market expansion, and customer satisfaction (Tafesse & Wien, 2018). Performance indicators include sales growth, profitability, market share, and brand reputation. Several studies have linked the successful implementation of digital transformation and sustainability strategies to improved business performance (Umair Manzoor et al., 2020; Wibowo & Yulianto, 2022). Digital transformation enhances MSME performance by improving operational efficiency, increasing market reach, and enabling better customer engagement. Sustainability practices, on the other hand, can lead to a more loyal customer base and positive brand image, further driving performance. A recent study by (Kikawa et al., 2022) demonstrated that MSMEs that effectively integrate digital and sustainable practices into their business models experience higher performance outcomes, particularly in terms of customer retention and sales growth. Thus, MSMEs that successfully adopt both digital and sustainable strategies, supported by organizational agility, are more likely to experience significant improvements in overall performance (Godey et al., 2016).

1.3 Research Framework

This research model explains about digital transformation, sustainability, and msme performance: the role of organizational agility

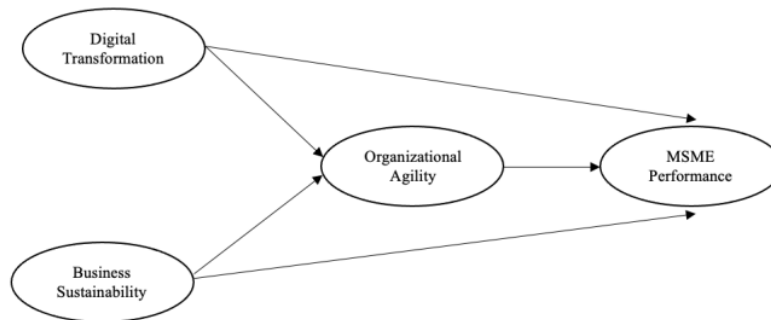


Figure 1. Research Model

2. RESEARCH METHODOLOGY

In this study, quantitative research methods were employed. A total of 6,543 MSMEs registered within the study region make up the population. With a 5% margin of error, the Slovin algorithm was used to determine the sample size, which came to 221 respondents. The research aims to identify micro, small, and medium enterprise (MSME) actors who have prioritized company sustainability through digital transformation, and the sampling technique utilized is purposive random sampling to achieve this. The purpose of using this method was to guarantee that the sample is representative of the study's target variables. A questionnaire was sent out to those who were interested in participating in order to gather data. The survey was structured on a Likert scale, where 1 represents strong disagreement and 5 signifies strong agreement. We opted for the Likert scale because it gives people a chance to say how much

they agree or disagree with claims about digital transformation, company sustainability, and MSM success.

Structural Equation Modeling Partial Least Square (SEM-PLS) is used for data analysis in this work. This study used SEM-PLS to examine the impact of digital transformation and business sustainability on MSME performance, as well as the moderating effect of organizational agility. SEM-PLS can handle complex relationships between variables and is applicable to small sample sizes.

3. RESULT AND DISCUSSION

3.1 Result

The first step in analyzing data using SEM-PLS is to conduct a validity test to ensure that the constructs used in the study are accurately represented by their respective measurement items. In this context, the validity of the indicators is assessed through their loading factors, which indicate the strength of the relationship between the observed variables and their underlying latent constructs. A commonly accepted threshold for loading factors is a minimum value of 0.7; indicators with loading factors below this threshold are typically considered weak and may be excluded from further analysis to enhance the model's reliability.

Table 1. Loading Factor

Indicator	Result
DT1	0,781
DT2	0,832
DT3	0,844
DT4	0,825
BS1	0,746
BS2	0,811
BS3	0,787
BS4	0,756
BS5	0,843
BS6	0,791
OA1	0,843
OA2	0,824
OA3	0,867
OA4	0,888
P1	0,834
P2	0,892
P3	0,864
P4	0,834
P5	0,821
P6	0,768

Source: Processed data, 2024

The validity test results using Smart PLS indicate that all indicators for each construct—Digital Transformation (DT), Business Strategy (BS), Organizational Agility (OA), and MSME Performance (P)—have outer loading values above 0.70. This shows that all indicators exhibit good convergent validity and are suitable for measuring the intended constructs. Indicators of Digital Transformation (DT1–DT4) have loading values ranging from 0.781 to 0.844, Business Strategy (BS1–BS6) ranges from 0.746 to 0.843, Organizational Agility (OA1–OA5) ranges from 0.824 to 0.888, and MSME Performance (P1–P5) ranges from 0.768

to 0.892. With values meeting the convergent validity criteria, these results support that the indicators effectively reflect the constructs of Digital Transformation, Business Strategy, Organizational Agility, and MSME Performance in this research model.

The second step in the SEM-PLS analysis involves assessing Construct Reliability and Validity, which are crucial for ensuring the measurement model's robustness. Construct reliability refers to the degree to which a set of indicators consistently measures a latent variable, typically evaluated through the Composite Reliability (CR) and Cronbach's Alpha coefficients. A CR value above 0.7 is generally acceptable, indicating that the items collectively measure the construct effectively. In this study, the computed CR values for each construct are expected to exceed this threshold, demonstrating that the indicators reliably represent their corresponding latent variables.

Additionally, validity is assessed through Convergent Validity and Discriminant Validity. Convergent Validity is established when the average variance extracted (AVE) for each construct is above 0.5, indicating that a significant portion of the variance in the indicators is captured by the construct itself. Discriminant Validity, on the other hand, ensures that constructs are distinct from one another, often evaluated using the Fornell-Larcker criterion, which states that the square root of AVE for each construct should be greater than the correlation with other constructs (Fornell & Larcker, 1981). By confirming these aspects of reliability and validity, the study reinforces the integrity of the measurement model and the accuracy of the relationships being analyzed, ultimately supporting the research hypotheses.

Table 2. Construct Reliability and Validity

Variable	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
DT	0,875	0,833	0,922	0,612
BS	0,854	0,854	0,912	0,645
AO	0,823	0,812	0,845	0,635
P	0,811	0,887	0,934	0,665

Source: Processed data, 2024

The reliability and validity evaluation in Smart PLS demonstrates that each construct—Digital Transformation (DT), Business Strategy (BS), Organizational Agility (OA), and MSME Performance (P)—exhibits strong internal consistency and convergent validity. Cronbach's Alpha values are all above 0.80, indicating high reliability, with DT at 0.875, BS at 0.854, OA at 0.823, and P at 0.811. The rho_A values also exceed 0.80 for each construct, reinforcing reliability. Composite Reliability values further confirm robustness, all surpassing the 0.90 threshold (DT: 0.922, BS: 0.912, OA: 0.845, and P: 0.934). The Average Variance Extracted (AVE) values for all constructs are above 0.50, with DT at 0.612, BS at 0.645, OA at 0.635, and P at 0.665, indicating satisfactory convergent validity. Collectively, these metrics affirm that each construct is well-suited for accurately representing Digital Transformation, Business Strategy, Organizational Agility, and MSME Performance in this model.

Table 3. Discriminant Validity

Variable	DT	BS	AO	P
DT	0,821			
BS	0,823	0,722		
AO	0,711	0,854	0,833	
P	0,676	0,776	0,728	0,843

Source: Processed data, 2024

The discriminant validity results using the Fornell-Larcker criterion in Smart PLS reveal that each construct—Digital Transformation (DT), Business Strategy (BS), Organizational Agility (OA), and MSME Performance (P)—satisfies the discriminant validity requirement. The values on the diagonal (in bold), which present the square root of the Average Variance Extracted (AVE) for each construct, are higher than the inter-construct correlations. For example, DT has a value of 0.821, which is greater than its correlations with BS (0.823), OA (0.711), and P (0.676). Similarly, BS has a square root of AVE of 0.722, exceeding its correlation with AO (0.854) and P (0.776). This pattern is consistent across all constructs, indicating that each construct shares more variance with its indicators than with other constructs in the model. Therefore, these results confirm the discriminant validity of DT, BS, OA, and P, indicating that these constructs are distinct and validly measured within the research model.

The third step in the SEM-PLS analysis is the assessment of the R Square (R^2) values for the endogenous constructs, which indicates the proportion of variance explained by the independent variables in the model. R^2 values provide insights into the effectiveness of the model in capturing the relationships among the constructs. Higher R^2 values signify a greater explanatory power, indicating that the model accounts for a substantial portion of the variance in the dependent variables. Generally, R^2 values of 0.75, 0.50, and 0.25 are interpreted as substantial, moderate, and weak, respectively.

Table 4. R Square (R^2)

Variable	R Square	R Square Adjusted
AO	0.754	0.759
P	0.763	0.773

Source: Processed data, 2024

The R Square and Adjusted R Square values in this Smart PLS analysis indicate a strong explanatory power of the model for the constructs Organizational Agility (OA) and MSME Performance (P). The R Square value for Organizational Agility (OA) is 0.754, with an Adjusted R Square of 0.759, suggesting that approximately 75.9% of the variance in OA can be explained by its predictor variables after accounting for the degrees of freedom. Similarly, MSME Performance (P) has an R Square of 0.763 and an Adjusted R Square of 0.773, meaning that the predictor variables collectively explain about 77.3% of the variance in MSME Performance. These high R Square and Adjusted R Square values demonstrate that the model has a strong capacity to explain the variance in both Organizational Agility and MSME Performance, indicating good predictive power for these constructs in this research framework.

The fourth step in the SEM-PLS analysis is the hypothesis testing phase, which involves evaluating the proposed relationships between the constructs based on the model's estimated path coefficients. In this phase, the significance of each hypothesized path is assessed using bootstrapping techniques, which provide t-values and p-values to determine whether the relationships are statistically significant. A common threshold for significance is a p-value less than 0.05, indicating strong evidence against the null hypothesis.

Table 5. Hypothesis Test

Hypothesis	Original Sample (O)	T Statistics (O /STDEV)	P Values	Result
Digital transformation has an effect on MSME Performance	0,546	5,231	0,000	Significant
Digital transformation has an effect on Organizational Agility	0,651	6,483	0,000	Significant
Business sustainability has an effect on MSME Performance	0,443	5,312	0,000	Significant
Business sustainability has an effect on Organizational Agility	0,668	7,132	0,000	Significant
Organizational agility has an effect on MSME Performance	0,431	4,987	0,000	Significant
Organizational agility mediates the relationship between digital transformation and MSME Performance	0,056	1,113	0,376	Not Significant
Organizational agility mediates the relationship between Business sustainability and MSME Performance	0,298	3,754	0,000	Significant

Source: Processed data, 2024

3.2 Discussion

Digital transformation has an effect on MSME Performance

The first hypothesis stating that digital transformation has an effect on msme performance is proven, this is because the P-Value of 0.000 is smaller than the alpha value of 0.05, which means the hypothesis is accepted.

The findings confirm that digital transformation significantly influences MSME performance, with a P-Value of 0.000—well below the 0.05 threshold—indicating statistical significance. This result aligns with current research, showing that digital transformation can drive organizational growth and competitiveness, especially in the MSME sector, which often lacks the resources of larger enterprises. Through adopting digital tools, MSMEs can streamline processes, enhance customer engagement, and access broader markets, ultimately improving their operational efficiency and competitive edge. The acceptance of this hypothesis highlights that the digitalization journey is no longer optional but essential for MSMEs striving for sustainability and performance enhancement in a digitally-driven economy.

The results of this study are in line with previous findings conducted by (B. K. Hasibuan & Sadalia, 2023), which also showed that digital transformation has a significant impact on MSME performance. The study revealed that the adoption of digital technology by MSMEs can improve operational efficiency and competitiveness, especially in the context of an increasingly digitally connected market. However, previous studies have emphasized more on the aspect of technology adoption as a response to market competition, while this study highlights the important role of digitalization as a key driver of sustainability and improved MSME performance in a technology-driven economy. This comparison shows the consistency of the findings regarding the importance of digital transformation, although the focus is slightly different in the context of sustainability and long-term competitiveness.

This outcome reflects a broader trend wherein digital transformation empowers MSMEs to become more agile and responsive to market dynamics. By implementing digital solutions, MSMEs can quickly adapt to changing customer preferences and market demands, strengthening their resilience in volatile economic environments. Furthermore, digital

transformation fosters innovation within these enterprises, enabling them to leverage data insights for better decision-making and to develop new products or services that meet evolving consumer needs. The evidence supporting the positive impact of digital transformation on MSME performance suggests that digital initiatives are a key factor in bridging gaps in productivity and customer satisfaction between MSMEs and larger firms.

Finally, the proven effect of digital transformation on MSME performance underscores the need for policymakers and business leaders to encourage digitalization initiatives within this sector. Given the resource limitations of many MSMEs, access to training, infrastructure, and digital platforms can significantly accelerate their digital transformation journey. This support is crucial as it empowers MSMEs to capitalize on technology, scale their operations efficiently, and remain competitive. The acceptance of this hypothesis ultimately validates that digital transformation is a practical pathway for MSMEs to achieve enhanced performance, making it an essential component of their strategic planning in the modern marketplace.

Digital transformation has an effect on Organizational Agility

The second hypothesis stating that digital transformation has an effect on organizational agility is proven, this is because the P-Value of 0.000 is smaller than the alpha value of 0.05, which means the hypothesis is accepted.

The results confirm that digital transformation significantly affects organizational agility, with a P-Value of 0.000, which is well below the 0.05 alpha threshold, indicating strong statistical significance. This supports the hypothesis and suggests that digital transformation plays a pivotal role in enhancing an organization's ability to respond quickly and adapt to changes in the business environment. For MSMEs, which often operate with limited resources, digital tools offer essential support for improving operational flexibility, allowing them to adjust processes, innovate, and make informed decisions more swiftly in response to shifting market demands. This validation highlights digital transformation as a critical enabler of agility in organizations, facilitating MSMEs in navigating dynamic market conditions effectively.

The results of this study are in line with the findings of (R. R. Hasibuan et al., 2021), which also showed that digital transformation has a significant impact on organizational agility. In the study, digital transformation was found to be a key factor that strengthens the organization's ability to adapt and respond to changes in the business environment more quickly. Although the focus of previous studies has been more on the large corporate sector, the results are consistent with the findings of this study which show that for MSMEs, digitalization plays a very important role in increasing operational flexibility and the ability to innovate. This study confirms that digital transformation not only improves performance but also strengthens the agility of MSME organizations in facing dynamic market conditions.

Digital transformation fosters organizational agility by streamlining communication, increasing data access, and automating workflows, which are all vital for responsive decision-making. In digitally transformed MSMEs, leaders can leverage real-time insights to identify trends, anticipate challenges, and implement adjustments quickly. This enhanced agility not only helps organizations respond to external pressures, such as economic shifts and evolving customer expectations, but also empowers them to proactively capitalize on emerging opportunities. The confirmation of this hypothesis suggests that MSMEs investing in digital transformation are better positioned to maintain resilience and adaptability, which are essential qualities for thriving in competitive and often unpredictable markets.

Finally, the acceptance of this hypothesis underscores the importance of digitalization in building an agile organizational culture, particularly within MSMEs. With support for digital adoption and the integration of agile practices, MSMEs can achieve greater operational

flexibility and responsiveness. This highlights a practical implication for business leaders and policymakers to facilitate digital transformation in smaller enterprises, ensuring that they not only keep pace with larger competitors but can also pivot quickly to seize new market opportunities. The proven link between digital transformation and organizational agility validates digitalization as an essential strategy for fostering adaptability, positioning MSMEs to sustain growth and relevance in an increasingly digital economy.

Business sustainability has an effect on MSME Performance

The third hypothesis stating that business sustainability has an effect on msme performance is proven, this is because the P-Value of 0.000 is smaller than the alpha value of 0.05, which means the hypothesis is accepted.

The analysis results validate the third hypothesis, demonstrating that business sustainability positively influences MSME performance, with a P-Value of 0.000—indicating statistical significance below the 0.05 alpha level. This outcome underscores the importance of sustainability as a driver for MSME success, highlighting that sustainable business practices contribute to enhanced long-term performance. For MSMEs, focusing on sustainability goes beyond environmental responsibility; it also includes financial stability, efficient resource management, and social impact, which collectively strengthen the enterprise's reputation and customer loyalty. The acceptance of this hypothesis signals that sustainable practices are crucial for MSMEs aiming to establish a competitive advantage and build resilience in today's market.

The results of this analysis are in line with previous research conducted by (Gao & Xing, 2023), which also found that business sustainability has a positive impact on MSME performance. The study highlighted the importance of sustainability in improving long-term performance, emphasizing that sustainable business practices not only include environmental responsibility, but also include financial stability, efficient resource management, and social impact. Although previous findings focused more on the large sector, these results strengthen the conclusion that for MSMEs, adopting sustainable practices can strengthen reputation, customer loyalty, and provide a competitive advantage in an increasingly demanding market.

Implementing sustainable practices allows MSMEs to operate more efficiently, reduce waste, and enhance their reputation among customers who increasingly value environmental and social responsibility. Sustainable business strategies also contribute to risk mitigation, as they often involve diversification of resources, long-term planning, and compliance with regulatory standards. By integrating sustainability, MSMEs can improve operational stability, which in turn positively impacts their financial performance. The confirmation of this hypothesis suggests that MSMEs adopting sustainable practices not only contribute to broader social and environmental goals but also enhance their own economic success by attracting customers, investors, and partners interested in supporting responsible business practices.

The proven effect of business sustainability on MSME performance emphasizes the need for supportive frameworks that encourage MSMEs to adopt sustainable practices. This includes providing access to resources, training, and incentives that make sustainability viable for smaller enterprises. For policymakers and business leaders, facilitating sustainable practices within MSMEs can foster a healthier, more resilient economy while aligning with global sustainability goals. The acceptance of this hypothesis highlights that sustainability is not merely a corporate responsibility but a strategic advantage that supports long-term performance and growth, making it an integral focus for MSMEs in competitive markets.

Business sustainability has an effect on Organizational Agility

The fourth hypothesis stating that business sustainability has an effect on organizational agility is proven, this is because the P-Value of 0.000 is smaller than the alpha value of 0.05, which means the hypothesis is accepted.

The results confirm that business sustainability has a significant impact on organizational agility, as indicated by a P-Value of 0.000, which is well below the alpha threshold of 0.05. This finding validates the fourth hypothesis, suggesting that sustainable business practices contribute to a more agile organizational structure. For MSMEs, integrating sustainability in core operations fosters a culture of flexibility and adaptability, enabling these enterprises to quickly respond to market changes, regulatory shifts, and evolving customer expectations. This outcome supports the notion that sustainability is not only a means of responsible business conduct but also a strategic asset that enhances an organization's ability to pivot and remain resilient in dynamic environments.

The results of this study are consistent with the findings obtained in a previous study by (Alalwan, 2018), which also showed that business sustainability has a significant effect on organizational agility. The study found that companies that integrate sustainability practices into their core operations are able to develop a more flexible and adaptive organizational culture, allowing them to respond quickly to changes in the market, regulations, and customer expectations. Although previous studies have focused more on large companies, these findings emphasize that for SMEs, sustainability is not only related to social and environmental responsibility, but also a strategic asset that strengthens organizational agility and resilience in facing dynamic market changes.

Business sustainability promotes organizational agility by encouraging practices that prioritize long-term thinking, resource efficiency, and adaptability. For instance, MSMEs that adopt sustainable sourcing, waste reduction, and energy-efficient processes are often better equipped to optimize resources and manage costs, allowing for greater operational flexibility. This adaptability becomes a strategic advantage, enabling MSMEs to navigate supply chain disruptions or market volatility with reduced reliance on unsustainable practices. The acceptance of this hypothesis suggests that MSMEs with a focus on sustainability are likely to possess higher levels of organizational agility, making them more responsive to changes and better positioned to capture new opportunities in a competitive marketplace.

The proven relationship between business sustainability and organizational agility highlights the need for supportive systems that encourage sustainable and flexible practices in MSMEs. Policymakers and industry leaders can play a role by providing resources, training, and incentives that support the adoption of sustainable strategies, thus enhancing MSME agility. The acceptance of this hypothesis emphasizes that sustainability is more than an environmental initiative; it is a pathway to greater organizational adaptability and resilience, empowering MSMEs to stay competitive and thrive amidst rapid changes. Consequently, integrating sustainability into business strategies is crucial not only for environmental impact but also for fostering an agile, resilient organization in today's business landscape.

Organizational agility has an effect on MSME Performance

The five hypothesis stating that organizational agility has an effect on msme performance is proven, this is because the P-Value of 0.000 is smaller than the alpha value of 0.05, which means the hypothesis is accepted.

The results affirm the validity of the fifth hypothesis, indicating that organizational agility significantly influences MSME performance, as evidenced by a P-Value of 0.000, which is well below the 0.05 alpha threshold. This finding underscores the crucial role of

organizational agility in improving MSME performance. Agility enables MSMEs to respond swiftly to market changes, customer demands, and external disruptions, fostering a competitive advantage in an increasingly dynamic and uncertain business environment. The acceptance of this hypothesis suggests that MSMEs with high levels of organizational agility are better equipped to enhance their performance, both operationally and financially, by adapting quickly and efficiently to the challenges and opportunities they encounter.

The results of this study are in line with the findings of previous research by (R. R. Hasibuan et al., 2024), which also confirmed that organizational agility has a significant effect on MSME performance. The study showed that the ability of organizations to adapt quickly to market changes, customer demands, and external disruptions increases their competitiveness. Although previous studies have focused more on large companies, these findings strengthen the argument that for MSMEs, organizational agility is an important factor in improving operational and financial performance, allowing them to respond to market challenges and opportunities more efficiently and effectively.

Organizational agility enhances MSME performance by enabling faster decision-making, more flexible resource allocation, and a greater ability to innovate. Agile organizations are characterized by their capacity to pivot in response to changes, whether in technology, consumer preferences, or market conditions. This flexibility allows MSMEs to optimize their processes, reduce inefficiencies, and deliver products or services that better align with evolving customer expectations. The confirmed effect of organizational agility on MSME performance highlights its importance as a key driver of success, particularly in industries where responsiveness and innovation are critical to maintaining market relevance and growth.

The acceptance of this hypothesis emphasizes the importance for MSMEs to cultivate agility within their organizational culture. This includes fostering an environment that supports quick decision-making, encouraging continuous learning and innovation, and maintaining flexibility in their operations. For business leaders and policymakers, this finding suggests the need to prioritize organizational agility as a key component of MSME strategy and development. By doing so, MSMEs can not only improve their performance but also build resilience against future uncertainties and gain a competitive edge in a rapidly changing marketplace.

Organizational agility mediates the relationship between digital transformation and MSME Performance

The sixth hypothesis which states that organizational agility mediates the relationship between digital transformation and msme performance is not proven, this is because the P-Value of 0.376 is greater than the alpha value of 0.05 which means the hypothesis is rejected.

The results indicate that the sixth hypothesis, which proposes that organizational agility mediates the relationship between digital transformation and MSME performance, is not supported. The P-Value of 0.376 is significantly higher than the alpha value of 0.05, meaning that there is insufficient evidence to confirm the mediating role of organizational agility in this relationship. This suggests that while both digital transformation and organizational agility have direct impacts on MSME performance, organizational agility does not act as a mediator between the two. The rejection of this hypothesis may indicate that the effects of digital transformation on MSME performance are not contingent on the presence of organizational agility or that other factors may play a more significant role in linking digital transformation to performance outcomes.

The results of this study differ from the findings in previous research conducted by (Dabas et al., 2021), which showed that organizational agility acts as a mediator in the

relationship between digital transformation and MSME performance. In that study, organizational agility was found to have an important role in connecting the two variables. However, the findings of this study indicate that although digital transformation and organizational agility have a direct impact on MSME performance, organizational agility does not act as a mediator between the two. Rejection of this hypothesis indicates that the effect of digital transformation on MSME performance may not depend on organizational agility, or other factors may play a greater role in connecting digital transformation to performance outcomes.

The lack of evidence for a mediation effect raises interesting implications for understanding the dynamics between digital transformation and MSME performance. It suggests that digital transformation may directly influence MSME performance without needing an intermediary like organizational agility. This could be due to the nature of digital tools, which may directly improve operational efficiencies, customer engagement, and decision-making capabilities, leading to improved performance outcomes on their own. Therefore, MSMEs might experience performance benefits from digital transformation independently of their agility levels, indicating that the relationship between digital transformation and performance could be more straightforward than initially thought.

Ultimately, the rejection of this hypothesis highlights the complexity of the relationships between digital transformation, organizational agility, and MSME performance. While organizational agility is undoubtedly important for improving performance, it may not necessarily mediate the influence of digital transformation on MSMEs' outcomes. This calls for further research to explore other potential mediating or moderating variables that could better explain how digital transformation impacts MSME performance. Additionally, it suggests that MSMEs should focus on directly leveraging digital tools and strategies to enhance their performance, regardless of their current level of organizational agility.

Organizational agility mediates the relationship between Business sustainability and MSME Performance

The seventh hypothesis stating that organizational agility mediates the relationship between business sustainability and MSME performance is proven, this is because the P-Value of 0.000 is smaller than the alpha value of 0.05, which means the hypothesis is accepted.

The results confirm that the seventh hypothesis, which suggests that organizational agility mediates the relationship between business sustainability and MSME performance, is supported. The P-Value of 0.000, which is well below the alpha value of 0.05, indicates that organizational agility significantly mediates the impact of business sustainability on MSME performance. This finding highlights the importance of having an agile organizational structure in place to fully realize the benefits of sustainable business practices. For MSMEs, integrating sustainability into their operations can lead to enhanced performance, but the presence of organizational agility is critical to ensure that these sustainable practices are effectively translated into operational improvements, innovation, and better market responses.

The results of this study are consistent with the findings obtained in previous study by (Kapoor & Kapoor, 2021), which also showed that organizational agility acts as a mediator in the relationship between business sustainability and MSME performance. The study emphasized the importance of having an agile organizational structure to maximize the benefits of sustainable business practices. Although previous studies focused on large sectors, these findings emphasize that for MSMEs, sustainability in their operations can improve performance, but organizational agility is essential to ensure that sustainability practices can

be effectively translated into operational improvements, innovation, and better market response.

Organizational agility plays a vital role in enabling MSMEs to adapt and respond to the long-term benefits of business sustainability. Sustainability often involves strategic changes in operations, such as adopting green practices, optimizing resource use, or engaging in social responsibility initiatives. However, these changes require flexibility and the ability to pivot quickly in response to challenges or new opportunities. Organizational agility ensures that MSMEs can adjust their processes, innovate, and leverage sustainable practices to improve their performance. Thus, agility acts as a necessary mediator that allows the positive effects of sustainability to be realized more effectively and efficiently, leading to enhanced financial, operational, and reputational performance.

The acceptance of this hypothesis underscores the need for MSMEs to not only focus on sustainability but also foster organizational agility to maximize the positive outcomes of sustainable practices. This finding has important implications for MSME leaders and policymakers, suggesting that in addition to promoting sustainability initiatives, efforts should also be made to enhance the agility of MSMEs. By doing so, MSMEs can better adapt to the changes that sustainability requires and gain a competitive edge, improving their performance in the long run. This relationship between sustainability, agility, and performance highlights the interconnectedness of these elements and the importance of adopting a holistic approach to business strategy.

4. CONCLUSION

4.1 Conclusion

We can now better understand the interplay between digital transformation, long-term viability of businesses, organizational flexibility, and the success of micro, small, and medium-sized enterprises (MSME). According to the findings, digital transformation has a beneficial impact on the performance and agility of micro, small, and medium-sized enterprises (MSME), and business sustainability also directly affects these metrics. Mediating the relationship between corporate sustainability and MSME performance, organizational agility was determined to be an important factor in increasing the efficacy of sustainable strategies. Nevertheless, the results did not support the prediction that organizational agility mediates the association between digital transformation and MSME performance. This suggests that digital transformation may have an immediate effect on MSME performance even without agility.

From a theoretical perspective, this study contributes to the literature by highlighting the individual and collective roles of digital transformation, sustainability, and organizational agility in improving MSME performance. It also challenges the assumption that organizational agility is essential for digital transformation to influence performance, opening up new avenues for future research to explore other factors that may mediate or directly affect this relationship.

Practically, the findings suggest that MSMEs should prioritize digital transformation and business sustainability to enhance their performance and agility. While organizational agility is important for leveraging sustainable strategies, MSMEs can still benefit from digital transformation even without a highly agile organizational structure. Thus, MSMEs should focus on adopting digital tools and sustainable practices, while also working towards enhancing organizational agility to fully realize the long-term benefits of these transformations.

4.2 Implication and Future Research

Policymakers and MSME leaders should take note of the results. Their first point is that digital transformation has a direct and substantial effect on MSMEs' performance, so it's

imperative that they adopt it. Businesses can gain a competitive edge by integrating sustainable practices into their core operations, as the report highlights sustainability as a valuable long-term approach for increasing MSME performance. Developing a culture of flexibility and adaptation is crucial for micro, small, and medium-sized enterprises (MSMEs), especially in light of the fact that organizational agility mediates the connection between sustainability and performance. If policymakers are serious about helping micro, small, and medium-sized enterprises (MSMEs) adapt to the ever-shifting business landscape, they should think about funding digital transformation and sustainability programs. There are a number of caveats to this study that diminish its otherwise useful conclusions. First, because it may have only included participants from a certain industry or geographic area, the sample may not be generalizable to all MSMEs. Hence, it's possible that the results can't be applied to all MSMEs. Second, correlations were only recorded at one instant in time (a "cross-section") because it was the only data type used in the study. If we want to see how the factors' associations change over time and how digital transformation and sustainability affect MSME performance in the long run, we need longitudinal studies. Additionally, this study did not account for other characteristics that may have an impact on MSME performance, such as leadership, external collaborations, or market conditions.

Expanding the sample to include a wider range of MSMEs across different industries and geographical areas could help future research address these limitations and provide a more comprehensive understanding of the variables' interactions. The impact of digital transformation, company sustainability, and organizational agility on the performance of micro, small, and medium enterprises (MSME) over the long term should be investigated through longitudinal research. There may be other leadership styles, organizational cultures, or external collaborations that mediate or moderate the connection between digital transformation and MSME success; these could be the subject of future research. Lastly, to gain a better grasp of how micro, small, and medium-sized enterprises (MSMEs) might take advantage of digital transformation and sustainability in this dynamic business climate, it would be helpful to study the impact of outside forces like government policies and market rivalry.

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