

The Influence of Digital Transformation on the Competitiveness of MSMEs with Performance as a Mediating Variable

A Study on MSMEs in Kediri City

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ABSTRACT

The contemporary business ecosystem environment continues to evolve rapidly, particularly with the advent of the Fourth Industrial Revolution. Businesses now have to adjust to a more competitive and digitally focused environment if they are to survive. This research is aimed at understanding the effects of digital transformation of MSMEs and its effects on competitiveness, as well as MSME performance, and the impact of digitization on the MSME performance of MSMEs in the City of Kediri. 390 respondents were sampled for the given study, and the data were analyzed using Structural Equation Modeling and Partial Least Squares Sem analysis. Findings support the theory that digital transformation impacts the MSME performance positively. Furthermore, it positively impacts the MSME's competitiveness. This is further demonstrated in the research, as the performance is stated to have a positive impact on their competitiveness. With the business performance improved financially, operationally, and in marketing, MSME's ability to generate value and strengthen a customer base and market position is enhanced. MSME performance mediates the influence of digital transformation on MSME competitiveness.

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Introduction

Micro, Small, and Medium Enterprises (MSMEs) are the backbone of the Indonesian economy, contributing more than 60% of Gross Domestic Product (GDP) and absorbing approximately 97% of the national workforce (Ministry of Cooperatives and SMEs, 2024). In the era of Industry 4.0, digital transformation is key for MSMEs to increase global competitiveness. However, many MSMEs still struggle to adapt to digital technologies such as e-commerce, online marketing, and cloud-based data management, leading to a decline in market share due to competition from larger players such as international marketplaces. Therefore, exploring the effect of digital transformation on the competitiveness of MSMEs is imperative [1]. Anderson et al. state, as a result of the COVID-19 pandemic, digital adoption across all sectors has increased by 7 years in comparison to pre-pandemic estimates. Digital transformation is not merely technology adoption; it encompasses a complete transformation of business practices, operational workflows, and customer relationships [2].

Research by Li et al demonstrated that the adoption of digital technologies optimizes business operations, increases market accessibility, and encourages product innovation [3]. In combination, e-commerce, social media and digital payment systems (i.e. 'fintech') provide MSMEs with the means to access a more expansive, and even global, customer base [4]. Sholihin findings indicate that digital transformation significantly contributes to strengthening a firm's competitive position [5].

Digital transformation extends beyond technological integration, encompassing fundamental changes in managerial thinking and business model structures among MSMEs. Through the effective utilization of ICT, MSMEs can streamline operations and achieve improved financial performance. Digitalization enables MSMEs to automate business processes, accelerate transactions, and optimize customer relationships [6]. However, this transformation process isn't always smooth sailing, requiring investment, training, and organizational readiness. With improved performance, MSMEs will be better able to compete sustainably in the global market.

MSME performance, as stated by Hidayat, represents a firm's capacity to accomplish its business objectives through efficiency, innovation, and enhanced productivity [7]. The implementation of digital transformation initiatives can further enhance MSME performance by facilitating better access to information, improving data governance, and optimizing supply chain processes. Meanwhile, the competitiveness of MSMEs is largely determined by their ability to respond effectively to technological advancements and evolving market requirements. Digital transformation affects a company's internal performance, such as operational efficiency and innovation, which then impacts external competitiveness. This

indicates that MSME performance serves as a mediator explaining how digital transformation ultimately improves competitiveness.

Kediri City is among the regions in East Java that has experienced significant growth in MSMEs over the last five years. This sector contributes substantially to the regional economy, particularly in terms of employment generation and the reinforcement of local economic development [8]. However, the challenges faced by MSMEs in Kediri are quite complex, particularly in terms of adopting digital technology and modern business management. Many businesses still use traditional methods in production and marketing. As a result, their competitiveness tends to be lower compared to MSMEs in larger cities. In this context, digital transformation can be a strategic solution to increase efficiency and competitive advantage.

The competitiveness of MSMEs includes the ability to maintain market position, create added value, and innovate in the face of competition. Rosari et al. states that competitive advantage is achieved through differentiation and cost efficiency, both of which can be supported by digital technology [9]. In the context of MSMEs, digital transformation enables improvements in product quality, customer service, and distribution network expansion. In the digital economy era, competitiveness depends not only on price but also on the ability to adapt to technological changes. Therefore, digitalization is key for MSMEs to survive and thrive. This study aims to empirically test this relationship in MSMEs in Kediri.

MSME performance can be measured through various indicators such as sales growth, workforce productivity, and cost efficiency. Digital transformation contributes to the improvement of these performance indicators through process automation, data-driven analysis, and system integration. MSMEs that implement digital systems experience increased revenue and efficiency in inventory management [10]. Similarly, Siregar and Daulay report that digital transformation significantly affects MSME performance [11]. Furthermore, Pradana et al. proves that digital transformation influences MSME performance [12]. This is different from the research results Wijaya et al. found that digital transformation does not affect the performance of MSMEs [13].

Literature Review

A. Digital Transformation

Digital transformation is gaining importance and growing in the fields of management and information systems, particularly as a strategic change in organizations driven by the use of digital technologies. Vial defines it as a deliberate process of improving an organization through major changes in its core elements, aided by information, computing, communications, and connectivity technologies [14]. This view emphasizes that digital transformation is not simply about adopting technology, but rather a comprehensive change to improve overall organizational performance. Similarly, Verhoef et al., who describe it as a technology-driven

change process that transforms how companies create value and structure their business models [15]. This perspective broadens the understanding that digital transformation impacts how organizations create and deliver value to customers.

Warner and Wäger view digital transformation as a form of strategic organizational renewal enabled by digital technologies to build new value propositions [16]. The emphasis on dynamic capabilities underscores the importance for firms to continuously adjust and reconfigure their resources to maintain competitive advantage in the digital age. Furthermore, Hess et al. contend that digital transformation constitutes a form of organizational change prompted by the extensive diffusion of digital technologies, necessitating the formulation of a digital strategy that is harmonized with the firm's overarching business strategy [17]. Thus, digital transformation contains elements of structural change, organizational culture, and governance.

B. MSME Performance

MSME performance refers to the extent to which a business achieves its desired goals and demonstrates successful operational results, measured by financial indicators (such as sales and profit growth) and non-financial indicators (such as customer satisfaction, innovation, and operational efficiency). Li et al. [3] stated that small business performance can be measured through revenue growth, increased number of customers, and successful product innovation after adopting digital technology. Meanwhile, Rauch et al., through their meta-analytic study, demonstrate that entrepreneurial orientation is positively and significantly associated with MSME performance, particularly with respect to business growth and profitability [18]. These findings suggest that internal factors such as innovation, proactivity, and risk-taking contribute to improved business performance.

C. Competitiveness

According to Verhoef et al., competitiveness in the digital age depends on an organization's ability to reconfigure its business model and value creation logic by leveraging digital transformation [15]. Companies that are able to integrate digital technology into their strategies and operations will have a stronger competitive position compared to their competitors. This perspective suggests that competitiveness is dynamic and heavily influenced by an organization's digital readiness. Hanelt et al. state that competitiveness emerges from an organization's ability to undertake strategic innovations triggered by technological change [19]. In their study on digital transformation, they explained that organizations that are able to strategically adapt to digital disruption will gain a sustainable competitive advantage. This confirms that competitiveness is not static, but rather the result of a continuous process of adaptation and innovation.

D. Hypothesis

The proposed hypotheses are:

- H1: Digital transformation positively and significantly affects MSME performance.
- H2: Digital transformation positively and significantly affects MSME competitiveness.
- H3: MSME performance positively and significantly affects MSME competitiveness.
- H4: MSME performance mediates the effects of digital transformation on MSME competitiveness.

Materials and Methods

A. Types and Approaches of Research

This study adopts a quantitative approach employing an explanatory research design. Explanatory research is intended to examine and clarify causal relationships among variables through systematic hypothesis testing [20]. The paradigm used is positivism, using numerical data processed statistically to test the theories and hypotheses that have been formulated.

B. Population and Sample

The population of this study comprised all MSMEs operating in Kediri City, East Java. According to data obtained from the Kediri City Office of Cooperatives and MSMEs for the most recent year, the total number of MSMEs exceeded 15,000, distributed across various sectors such as trade, culinary businesses, creative industries, and services. This population was chosen because it is directly targeted by the digital transformation process being promoted by the local government and has significant potential in increasing local economic competitiveness through the use of digital technology.

A non-probability sampling strategy was adopted in this study, specifically using purposive sampling, in which the selection of respondents was based on specific eligibility criteria relevant to the research aims. Consequently, not all members of the population had an equal opportunity to be included in the sample; only business units that met the following research criteria were selected:

- MSMEs that have been operating for at least 2 years.
- MSMEs that have utilized digital technology, both in marketing aspects (such as social media or e-commerce), digital payments, and business management.
- MSMEs domiciled and operating in the administrative area of Kediri City.

Based on calculations using the Slovin formula at a margin of error of 5%, a sample size of $n = 390$ respondents was obtained. This number is considered representative enough to describe the characteristics of the MSME population in Kediri City in general.

From a total population of 15,000 business units, researchers first identified a list of MSMEs that met the purposive criteria above through data from the Cooperatives and MSMEs Office and initial field observations. Next, from the group of MSMEs that met these criteria, a

total of 390 business units were selected using simple random selection from the list that had met the criteria, in order to maintain the element of representativeness in the context of purposive sampling. The sample size is deemed adequate to reflect the overall profile of MSMEs in Kediri City, especially within the context of digital transformation practices and their implications for organizational performance and competitive advantage.

C. Research Variables and Operational Definitions

This study uses three main types of variables, namely exogenous variables (digital transformation), intervening variables (MSME performance), and endogenous variables (MSME competitiveness).

1. Exogenous Variable (X): Digital Transformation

Digital transformation represents an organized and strategic process in which MSMEs embed digital technologies into key business areas such as marketing, transactions, information management, and customer engagement to enhance overall organizational effectiveness. The digital transformation variable indicators are adapted from Matt et al. [21] and Verhoef et al. [15] consisting of digital marketing, e-commerce and digital platforms, operational digitalization, digital payments, digital communication, and digital literacy and competence.

2. Intervening Variable (Z): MSME Performance

MSME performance is the result of business achievements measured through increased productivity, cost efficiency, sales, and the ability to adapt and innovate to changes in the business environment. MSME performance variable indicators are adapted from Taouab & Issor [22] consists of financial performance, operational performance, market performance, and innovation performance

3. Endogenous Variable (Y): Competitiveness of MSMEs

Competitiveness is the ability of MSMEs to offer superior products and services compared to their competitors through innovation, efficiency, and utilization of digital resources.

The competitiveness variable indicator is adapted from Pasaribu [23] consisting of product excellence, innovation, human resources, and marketing with the utilization of information technology.

All variable indicators are measured using a 5-point Likert scale.

D. Data Analysis Techniques

The data analysis technique used in this study was Partial Least Squares – Structural Equation Modeling (PLS-SEM). This method was chosen because it is capable of analyzing causal relationships between complex latent variables, including direct and indirect influences

through intervening variables. PLS is suitable for use in research with predictive conceptual models, relatively moderate sample sizes, and data that is not fully normally distributed [24].

Results and Discussion

A. Structural Model Estimation

Fig. 3 presents the results of the research structural model estimation using the Partial Least Squares – Structural Equation Modeling (PLS-SEM) approach. This model illustrates the relationship between the variables of Digital Transformation, MSME Performance, and MSME Competitiveness, including the contribution of each indicator in forming the latent construct. In addition, the model also shows the magnitude of the path coefficients between variables and the coefficient of determination (R^2) value that explains the ability of the independent variables to explain the dependent variable. Figure 3 provides a comprehensive overview of the strength of the relationship between variables as well as the quality of the measurement model (outer model) and structural model (inner model). Through this model, it can be seen how digital transformation affects MSME performance and competitiveness, both directly and indirectly through mediating variables.

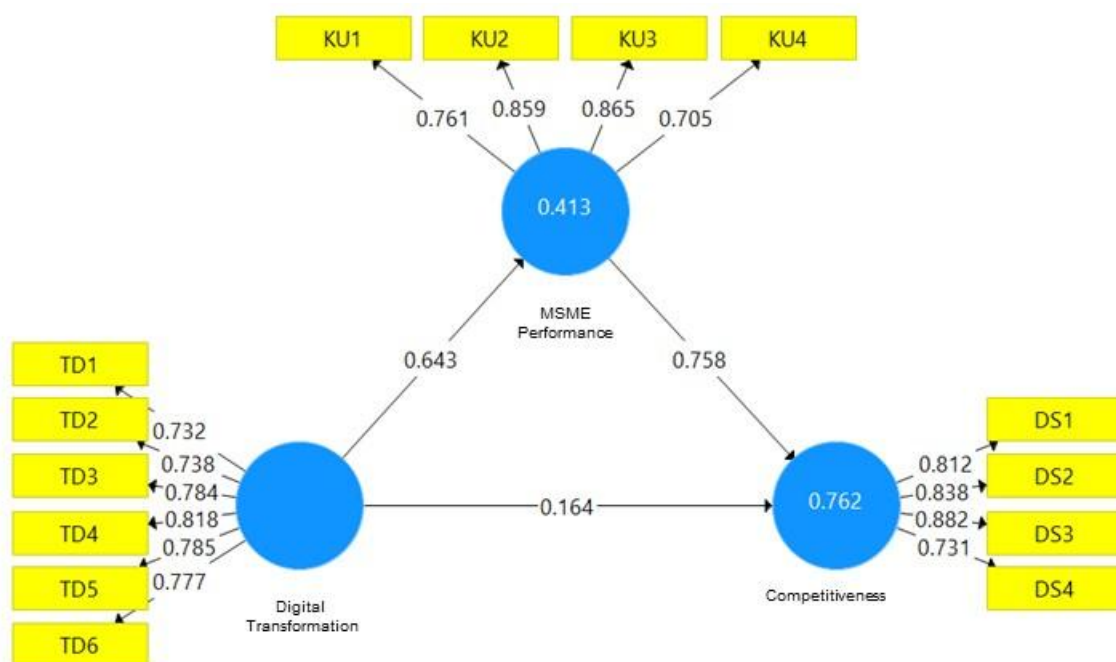


Fig. 3. SEM-PLS results

Fig. 3 shows that the Digital Transformation variable is measured by six indicators (TD1–TD6) with outer loading values ranging from 0.732 to 0.818. All values are above the minimum threshold of 0.70, indicating that each indicator has good convergent validity in representing the digital transformation construct. This means that these indicators are able to explain the digital transformation variable strongly and consistently.

The MSME performance variable is measured by four indicators (KU1–KU4) with loading values ranging from 0.705 to 0.865. This value indicates that all indicators are valid in explaining MSME performance, with indicator KU3 having the largest contribution. The R^2 value of 0.413 for the MSME performance variable indicates that 41.3% of the variation in MSME performance can be explained by digital transformation, while the remainder is influenced by other factors outside the research model.

The MSME Competitiveness variable is measured through four indicators (DS1–DS4) with outer loading values ranging from 0.731 to 0.882, which also indicates good measurement quality. The R^2 value of 0.762 indicates that 76.2% of the variation in MSME competitiveness can be explained by digital transformation and MSME performance together. This figure indicates that the model has strong explanatory power in explaining the factors that influence MSME competitiveness.

B. Hypothesis Testing

Hypothesis testing in this study was conducted to determine the magnitude of the influence between the variables studied, namely Digital Transformation, MSME Performance, and MSME Competitiveness. The analysis was conducted using the Partial Least Squares – Structural Equation Modeling (PLS-SEM) approach by examining the path coefficient, T-statistic, and P-value. The hypothesis is accepted if the T-statistic is greater than 1.96 and the P-value is less than 0.05, which indicates a positive and statistically significant relationship between the variables. The results of the hypothesis testing are presented in the following table.

Table 1. Hypothesis Testing

Hypothesis	Relationship between variables	Path Coefficient (β)	T-Statistic	P-Value	Results
H1 Digital Transformation → MSME Performance	Direct influence	0.643	16.970	0.000	Accepted
H2 Digital Transformation → MSME Competitiveness	Direct influence	0.164	4.707	0.000	Accepted
H3 MSME Performance → MSME Competitiveness	Direct influence	0.758	28.191	0.000	Accepted
H4 Digital Transformation → MSME Performance → MSME Competitiveness	Indirect influence (mediation)	0.487	14.766	0.000	Accepted

Based on Table 3, all hypotheses are accepted. as evidenced by a p value of less than 0.05.

Discussion

A. The Influence of Digital Transformation on MSME Performance

Digital transformation impacts the performance of MSMEs in Kediri City. Implementing digital technologies such as digital marketing, digital-based management systems, and online transactions helps MSMEs improve operational efficiency and business management effectiveness. Adopting digital technology can accelerate business processes, expand market

reach. and improve MSMEs' ability to respond to dynamic consumer demand [12]. Digital transformation also drives improved marketing capabilities through the use of digital media. thereby increasing sales volume and business productivity. This finding is consistent with other quantitative research showing that digitalization strengthens MSME performance in terms of productivity. profitability. and product and service innovation [25].

Improving MSME performance through digital transformation is closely related to the ability of business actors to utilize digital platforms as a strategic tool to expand market share and improve customer service processes. Digital transformation gives MSMEs access to broader marketing features such as online stores and social media. thereby increasing product visibility and direct relationships with consumers. Furthermore. MSMEs' digital literacy has proven to be a determining factor in the successful implementation of digital technology in their businesses. making training and mentoring crucial for optimizing the benefits of digitalization [12]. This shows that MSME performance depends not only on technology adoption but also on the internal capacity to understand and use technology effectively.

Digital transformation helps MSMEs improve access to information and real-time market evaluation. enabling faster and more accurate operational decisions. Other research also shows that digitalization supports MSMEs in strengthening innovation and responding to changing market needs. which are key drivers of business competitiveness in the digital era [25]. Therefore. digital transformation strategies must be continuously developed by providing adequate training support. IT infrastructure. and policies to ensure MSMEs are able to sustainably maintain and improve their business performance.

B. The Influence of Digital Transformation on the Competitiveness of MSMEs

Digital transformation impacts the competitiveness of MSMEs. meaning that their ability to integrate digital technology into their business processes can enhance their competitiveness in both local and national markets. Adopting digital technologies such as e-commerce platforms. digital marketing systems. App-based services enable MSMEs to reach a wider market and respond more quickly to consumer needs. Digital transformation also contributes to increased operational effectiveness by leveraging digital data for more accurate and efficient decision-making [7],[26],[27]. Thus. MSMEs that successfully implement digital strategies have a greater opportunity to compete with other businesses in an increasingly digitalized business environment.

The impact of technology is not merely an operational tool but also a source of competitive advantage. Business digitalization supports MSMEs in creating added value through product differentiation. personalized service. and improving the quality of interactions with consumers through social media and marketplaces [28]. Furthermore. MSMEs that actively optimize digitalization are typically more adaptive to changing market trends and better able to

maintain customer loyalty than those that have not yet digitized. Therefore, digital transformation should be viewed as a core strategy for holistic and sustainable competitiveness.

The impact of digital transformation also reflected in their increased capacity to keep up with the ever-changing developments in information technology. MSMEs that adopt digitalization generally have better access to market information, product innovation, and collaboration with business partners through digital networks. This enables MSMEs to increase productivity and cost efficiency, thereby significantly strengthening their competitiveness. Therefore, strengthening digital literacy and policy support are crucial factors in ensuring that digital transformation can be implemented effectively and positively impact the competitiveness of MSMEs in various regions [29].

C. The Influence of MSME Performance on MSME Competitiveness

MSME performance influences MSME competitiveness, meaning that improving business performance is an important foundation in strengthening MSMEs' competitive position in the market. Better performance reflects MSMEs' ability to manage resources, increase productivity, and provide more value to consumers, thus directly strengthening their competitive advantage over competitors. This aligns with research findings that organizational performance positively influences the ability to achieve and sustain competitive advantage, including higher sales, product innovation, and greater responsiveness to dynamic market demands [30].

In the context of MSMEs, improved business performance is often associated with increased competitiveness because good performance enhances reputation, operational efficiency, and adaptability to changes in the business environment. Research on Batik SMEs in Indonesia found that organizational performance significantly strengthens competitive advantage, especially when supported by innovation and effective knowledge management [31]. These findings demonstrate that performance improvement strategies not only have short-term impacts but also form the foundation of MSMEs' ability to survive and excel in market competition.

From a theoretical perspective, the Resource-Based View (RBV) also explains the positive link between performance and competitiveness, asserting that lasting competitive edge stems from leveraging unique resources and exceptional internal capabilities. In the context of MSMEs, improved performance reflects the optimization of internal capabilities such as innovation, product quality, and process efficiency, which ultimately supports the achievement of sustainable competitive advantage amidst global competition and local market dynamics. Furthermore, MSMEs that effectively utilize their strategic resources are more likely to adapt to market changes and maintain long-term business sustainability.

D. The Influence of Digital Transformation on MSME Competitiveness through MSME Performance

Digital transformation impacts the competitiveness of MSMEs through their performance. This means that the implementation of digital technologies such as e-commerce, digital marketing, internal digital systems, and IT-based innovation can drive improved business performance. Digitizing MSME business processes improves operational efficiency, record-keeping accuracy, and speed of customer service, thereby directly improving financial and non-financial performance indicators. Digital transformation has a positive correlation with organizational performance, which in turn contributes to a business's competitive position in an increasingly competitive market. This shift reflects that digitalization is not simply the adoption of technology, but also changes in how MSMEs create value and respond to the market [32].

The improved performance of MSMEs due to digital transformation is evident in increased productivity, sales growth, and the ability to capture new market share, which are key elements in enhancing business competitiveness. When MSMEs' internal performance improves, including their capacity for innovation, responsiveness to consumer demand, and resource management, they are in a stronger position to compete with other businesses both locally and nationally. This relationship is further strengthened by the theoretical frameworks of the Resource-Based View (RBV) and Dynamic Capabilities, which state that superior internal capabilities can be a source of sustainable competitive advantage. This explains why performance is a crucial mediator between digital transformation and MSME competitiveness, as MSME innovation and digital capabilities require superior performance to translate into competitive advantage [33].

Rahmiyati & Pristiana [34] study on MSMEs in East Java demonstrated that business performance significantly boosts competitiveness and mediates the link between digital transformation and SME competitiveness, as validated through a quantitative structural model. These findings reinforce the role of performance as a key channel through which digitalization helps small and medium enterprises maintain and expand their market share. Thus, digital transformation not only directly impacts competitive advantage. But its primary effect is mediated by performance improvements occurring within the organization. Internal process improvements. The use of digital data for decision-making. Product and service innovation are some aspects that strengthen this relationship. Therefore, an effective MSME development strategy needs to integrate digitalization with efforts to improve operational performance as a foundation for achieving higher competitiveness in an increasingly digitalized market.

Conclusion

The research analysis reveals that digital transformation positively and significantly enhances MSME performance in Kediri City. This demonstrates the beneficial role of integrating digital technologies into business operations. such as online marketing. financial applications. and digital platforms. can improve operational efficiency. productivity. and business management effectiveness. Digital transformation helps MSMEs accelerate business processes and improve the quality of service to consumers.

Digital transformation has been proven to have a positive and significant impact on the competitiveness of MSMEs. MSMEs that are able to adopt digital technology tend to have broader market reach. more effective promotional capabilities. and faster responsiveness to changing consumer needs. This makes MSMEs more adaptive and in a stronger position to face the increasingly fierce business competition in the digital economy era.

MSME performance has a positive and significant impact on MSME competitiveness. Improved business performance. whether financial. operational. or marketing. directly contributes to MSMEs' ability to create added value. retain customers. and strengthen their market position. In other words. strong performance is the primary foundation for building MSME competitive advantage.

MSME performance has been shown to act as a mediating variable in the relationship between digital transformation and MSME competitiveness. This means that digital transformation not only directly impacts competitiveness but also enhances competitiveness through prior improvements in business performance. Therefore. the more optimal the implementation of digital transformation in MSMEs. the greater the performance improvement. ultimately driving sustainable business competitiveness.

Recommendations

MSMEs in Kediri City are advised to continue leveraging digital technology in various aspects of their businesses. not only in marketing but also in financial management. inventory. and customer service. Enhancing digital literacy and technology skills is essential to ensure digital transformation delivers real improvements in business performance.

For local governments and related agencies. the results of this study can serve as a basis for designing more targeted mentoring and training programs for MSME digitalization. Support in the form of training. facilitating access to digital platforms. and providing technological infrastructure will help MSMEs improve their performance and strengthen their competitiveness in an increasingly digitalized market.

For future researchers. it is recommended to expand the study by broadening the research area. incorporating additional variables such as digital literacy. product innovation. or policy support. and adopting a longitudinal approach. This is crucial for gaining deeper

insights into the long-term effects of digital transformation on MSME performance and competitiveness across diverse regional contexts.

Conflict of Interest

The author declares that there is no conflict of interest in this research.

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