

Analysis of Factors Affecting the Success of Digital Transformation in MSMEs

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Abstract

This study aims to analyze the factors that influence the success of digital transformation in MSMEs, focusing on three main aspects: Human Resources (HR), leadership, and technology. A qualitative approach was used with in-depth interviews with five MSME players in various sectors. The results show that adaptive HR with digital learning capabilities greatly influence the smoothness of the transformation process. Visionary and proactive leadership also facilitates successful digital change, while the selection of technology that suits the needs and capabilities of MSMEs also plays an important role. These findings confirm that the success of digital transformation depends not only on technology, but also on the synergy between leadership, HR, and the selection of the right technology. This research provides insights for SMEs to plan more effective and contextual digital transformation strategies, taking into account internal capacities and challenges faced.

Kata kunci: Digital Transformation; Human Resources; Leadership; Technology; MSMEs

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Introduction

Digital transformation has become an urgent necessity for businesses in the Industry 4.0 era, which is characterized by the integration of digital technology into various aspects of business (Ghobakhloo & Iranmanesh, 2021). Advances in information technology, such as artificial intelligence, the Internet of Things (IoT), and cloud systems, have driven major changes in how companies operate, interact with customers, and create value (Mallikarjuna Paramesha et al., 2024). This situation has been further exacerbated by the COVID-19 pandemic, which has accelerated global digitalization, including in the micro, small, and medium enterprise (MSME) sector. Restrictions on mobility and changes in consumer behavior, which now rely more on online services, have prompted MSMEs to adapt by utilizing digital technology in order to maintain business continuity (Alam et al., 2023). In this context, digital transformation is no longer an option, but a necessity for MSMEs to survive, compete, and grow amid increasingly complex and digitized market dynamics (Ueasangkomsate, 2025).

In line with these developments, the business landscape has undergone drastic changes that require MSME players to immediately adopt digital technology as a strategy for survival and growth (Ausat et al., 2025). Business competition is no longer limited to the local level, but has expanded to the global level through the use of digital platforms that connect producers with consumers without geographical boundaries. Consumers are also becoming more savvy and demand fast, easy, and responsive services, which are difficult to fulfill without technological support (Ali et al., 2023). MSMEs that are unable to keep up with digitalization risk losing their competitiveness, facing business stagnation, and eventually being eliminated

from the market (Marozau et al., 2024). Therefore, the adoption of digital technology is crucial for the sustainability and growth of MSMEs in the modern business ecosystem

MSMEs play a vital role in the Indonesian economy. Data from the Ministry of Cooperatives and SMEs shows that in 2023, MSMEs in Indonesia reached around 66 million business units, accounting for more than 99% of the total business units in the country (Fauzan, 2025; Kemendagri, 2024). Its contribution to the national Gross Domestic Product (GDP) reached 61%, equivalent to around Rp9,580 trillion. In addition, the MSME sector employs more than 117 million workers, or around 97% of the total workforce in Indonesia (Fauzan, 2025). This significant contribution makes MSMEs a key pillar of the Indonesian economy, making it crucial to strengthen them through various policies, including digital transformation that can improve efficiency and competitiveness.

Despite playing a very important role in the economy, MSMEs face significant challenges in the digitization process compared to large companies. One of the main challenges is limited resources, both financial and human (Salamzadeh & Dana, 2021). Many MSMEs have limited capacity in terms of investment in technological infrastructure, as well as difficulties in recruiting workers with adequate digital skills. In addition, access to adequate technology is often an obstacle, especially for MSMEs located in areas with limited internet connectivity or that do not yet have adequate equipment to support digital operations (Hendrawan et al., 2024). Another challenge is the low level of digital literacy among MSME players, which hinders them from utilizing the potential of technology to improve operations, marketing, and customer service (Wulandari et al., 2024). Unlike large companies that have sufficient resources to invest in research and development of technology and human resource training, MSMEs often have to struggle harder to access information, training, and technology that are relevant to their needs.

Although many studies have discussed digital transformation, there is still a lack of qualitative studies that explore in depth how these three factors (human resources, leadership, and technology) interact in the context of MSMEs. Most studies tend to rely on quantitative data, which does not always capture the internal dynamics and specific challenges faced by SME actors in dealing with these changes. Therefore, it is important to understand the real experiences of SME actors in facing the digital transformation process in order to generate more contextual and applicable insights. Qualitative studies allow researchers to explore more in-depth factors, such as how human resources respond to change, how leadership encourages technology adoption, and how the technology is actually implemented in the field. These insights are invaluable for designing more effective policies or strategies to support MSMEs in the digitalization process.

This study aims to analyze internal factors that influence the success of digital transformation in MSMEs, with a focus on human resources, leadership, and technology. In terms of human resources, this study will explore the digital competencies and adaptability of employees. In terms of leadership, it will examine how visionary leadership styles drive change. Meanwhile, in terms of technology, this study will assess the accessibility, suitability, and implementation of technology in supporting the digitalization of MSMEs.

Method

This study uses a descriptive qualitative approach to explore in depth the internal factors that influence the success of digital transformation in MSMEs, particularly in terms of human resources, leadership, and technology. Data collection techniques were carried out through semi-structured interviews with owners and/or managers of MSMEs that have undergone or are undergoing the digitization process. Informants were selected using purposive sampling, which took into account criteria such as business scale, business sector, and level of digital technology adoption. The data obtained was analyzed using thematic analysis methods, with steps such as interview transcription, coding, identification of main themes, and drawing conclusions. Data validity was strengthened through source triangulation and member checking, to ensure that the researchers' interpretations were consistent with the informants' actual experiences. This method was chosen so that the study could fully capture the internal dynamics of MSMEs in facing the challenges and opportunities of digital transformation.

Result and Discussion

This study produced several findings, which are presented in Table 1 below.

Table 1. Summary of Research Results

Factors	Findings	Interpretation	Implications
Human Resources	- The majority of human resources have limited basic digital skills. - MSMEs adapt more quickly when they involve younger generations in their operations. - Training is conducted informally through social media or self-study.	Human resources are a determining factor in technology adaptation, but limited digital literacy poses an initial challenge. The presence of the younger generation brings advantages in accelerating transformation.	Structured training support or technical guidance appropriate to the context of MSMEs is needed so that human resources can optimally support digital transformation.
Leadership	- MSME owners play a direct role in the digitization process. - Most owners are open-minded and try out technology independently. - One informant expressed hesitation due to limited knowledge and concerns about risks.	Visionary leadership that is open to change is the main driver of digital transformation. However, unprepared leadership can be an obstacle.	Increasing awareness and digital literacy among business owners/leaders is important to strengthen innovative leadership in digitalization.
Technology	- All informants have used at least one digital technology. - Technologies were chosen based on ease of use and low cost, not because of advanced features. - The suitability of the technology to their needs was the main consideration.	The choice of technology is still pragmatic and simple. Not all technologies are ideal, but they are functional enough for the scale of the business.	Support for appropriate technology access and assistance in selecting digital solutions will strengthen the effectiveness of technology in MSME operations.
Synergy Between Factors	A combination of adaptive leaders, responsive human resources, and appropriate technology results in smooth digitization.	These three factors are interrelated and influence the overall success of digital transformation. Weaknesses in one	An integrative approach to digital transformation strategy is essential. Interventions in one factor must take into

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- Imbalances in any one of these factors (e.g., passive leaders or unprepared human resources) hinder the process.
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1. The Role of Human Resources in Digital Transformation

All informants emphasized that human resources play a crucial role in supporting the success of digital transformation. The majority stated that the digitization process does not only depend on the availability of technology, but more on the extent to which human resources are able to adopt and utilize it effectively. Three out of five informants said that the ability to adapt to new technology remains a major challenge, especially among employees who have a non-technical background or are not accustomed to using digital devices in their daily work activities.

However, two informants reported that simple internal training and informal learning, such as through video tutorials on social media, were quite helpful in accelerating the adaptation process. This process generally takes place gradually and relies on a practical approach based on daily operational needs, such as training in the use of transaction recording applications or the use of social media platforms for product marketing. Most informants also emphasized the importance of basic digital competencies in building the foundation for business digitalization. Mastery of digital cashier applications, e-commerce platforms, and digital marketing strategies are becoming essential skills for human resources in the MSME environment. Informants acknowledged that human resource limitations in this area can slow down the implementation of digital systems and even cause resistance to change.

Interestingly, digital transformation runs more smoothly in MSMEs that involve young people in business operations (Anggi Pranata et al., 2025). Business owners have observed that younger generations, both as business owners and support staff, tend to have better digital literacy, are more flexible towards technological updates, and are more open to digital experimentation in business processes. Therefore, the age and experience composition of human resources is an important factor that indirectly influences the success of adaptation to digital transformation (Jafari-Sadeghi et al., 2023; Ullrich et al., 2023). These findings indicate that human resource capacity building, both through formal and informal training, as well as the recruitment of human resources with digital skills, are key strategies for MSMEs to survive and thrive in the digital age. Without human resource readiness, the presence of technology will only be a potential that is not optimally utilized.

2. Visionary and Innovative Leadership

The role of leadership in the digital transformation process of MSMEs has emerged as one of the main driving factors that determine the direction, speed, and success of technology implementation in business (AlNuaimi et al., 2022). In this study, all informants were business owners who also played a direct role as strategic decision makers. This made their leadership style highly influential on the readiness and acceptance of change in their respective business environments.

Four out of five informants demonstrated a proactive attitude, openness to change, and a spirit of independent learning related to developments in digital technology. They actively

monitor digital trends, explore new platforms such as marketplaces and digital cashier applications, and use social media as a marketing tool. This openness is reflected in their efforts to gradually try out various technological solutions even without the support of experts. The leadership demonstrated is visionary, future-oriented, and able to see the opportunities offered by digitalization as a tool to expand market reach and improve operational efficiency.

One of the hallmarks of leaders who successfully implement digital transformation is the courage to take risks and innovate despite limited resources (Abbu et al., 2022). These informants are not only the main drivers in adopting technology, but also provide encouragement and real examples for employees to change. They build a flexible and adaptive organizational culture, which is an important asset in facing digital disruption. However, there is still one informant who shows hesitation and caution in facing digital transformation. Concerns about implementation costs, potential failures, and a lack of technical understanding are the main reasons for this hesitation. This informant prefers to maintain the conventional system while waiting for a time that is considered safer for transformation. This attitude illustrates a challenge often faced by MSMEs, namely limited managerial capacity in assessing risks and managing change.

These findings show that visionary, innovative, and bold leadership styles play an important role in driving the success of digital transformation in MSMEs. Conversely, passive or overly cautious leadership can potentially hinder the change process. Therefore, strengthening digital leadership capacity is essential in supporting MSMEs as they move towards an increasingly digitized business era.

3. Accessibility and Technology Suitability

All informants in this study have integrated at least one form of digital technology into their business operations, indicating an awareness and willingness to adapt to digital developments. The use of technology varies, ranging from simple financial recording applications, social media platforms for promotion and customer interaction, to marketplaces and inventory management applications. This shows that digital transformation at the MSME level is mostly gradual and pragmatic, tailored to the specific needs and internal capabilities of each business actor (Liu et al., 2022).

However, four out of five informants admitted that limited funds and technical knowledge were factors that hindered them in choosing and optimizing more complex technologies. As a result, many MSMEs prefer technologies that are easily accessible, inexpensive, and do not require in-depth technical training, even though these choices may not necessarily be the most optimal solutions in the long term. This approach shows that cost efficiency and practicality of use are the main priorities over sophisticated features or technology scalability.

Accessibility and ease of use are central considerations in the process of selecting digital tools. One informant, for example, uses WhatsApp Business for customer service and Google Forms for recording transactions, because both platforms are considered easy to understand and do not require special training. In addition, this type of technology is already familiar to customers, facilitating the overall adoption process. Furthermore, informants also emphasized the importance of matching the technology adopted with the real needs of the business. Some informants felt that overly complex technology actually hinders productivity because it requires

a long adaptation period or is incompatible with the scale of their business. Therefore, MSMEs tend to prefer functional and contextual solutions rather than universal or high-end ones.

This finding confirms that in the context of MSMEs, technology is not only a matter of availability, but also of affordability, ease of use, and relevance. Given limited resources, technology selection must be tailored to internal capacity and specific operational needs. Therefore, support in the form of practical training, guidance on technology selection, and affordable digitalization financing schemes are essential to drive more equitable and sustainable digital transformation in the SME sector.

4. Synergy Between Factors

The findings of this study indicate that the interaction between human resources, leadership, and technology forms the main foundation for the success of digital transformation in MSMEs. These three factors do not stand alone, but dynamically influence each other in the ongoing process of change. MSMEs led by visionary business owners who are open to innovation and capable of providing clear strategic direction tend to create a work environment conducive to the digitization process. In such situations, even though human resources may initially have limited digital competencies, they demonstrate a willingness to learn and adapt, especially when they feel supported and given room to grow.

The combination of strong leadership and adaptive human resources enables MSMEs to utilize digital technology more optimally, even in its simplest form. For example, the use of social media, financial recording applications, or online communication tools can be implemented effectively thanks to the encouragement of active leaders and human resources who are willing to embrace change. This shows that the success of digital transformation is not solely determined by the sophistication of the technology used, but also by the readiness of human resources and leadership direction.

Conversely, MSMEs led by individuals who are passive, risk-averse, or overly cautious in adopting technology tend to face bottlenecks in the digitization process. In such cases, even when technology is available, a lack of initiative from leadership and resistance to change from human resources become major obstacles. Human resources who are reluctant to learn or feel disempowered will tend to stick to old ways of working, which leads to stagnant innovation and low business competitiveness (Linhart, 2024). Thus, the results of this study emphasize the importance of harmony between progressive leadership, a workforce that is ready to develop, and technology that meets needs as important prerequisites in the digital transformation process of MSMEs. An imbalance in even one of these elements can hinder the overall adaptation process, while synergy between the three will create an innovative ecosystem that drives sustainable growth in the digital age.

Conclusion

The success of digital transformation in MSMEs is influenced by the interaction between human resources, leadership, and technology. Adaptive human resources with digital learning capabilities support the smooth process of transformation. Visionary and proactive leadership in adopting digital technology drives positive change in the business. Meanwhile, choosing the right technology, in line with the needs and capabilities of MSMEs, is an important factor in the success of digital implementation. This study confirms that the synergy of these three factors is crucial to the success of digitalization in MSMEs. An imbalance between these factors

can hinder digital transformation, while success lies in the readiness of human resources, leadership support, and the selection of technology that is relevant to the capacity of the business.

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