



The Effect of Technological Adaptation For MSME Actors In RW 04 Area Ketawanggede, Malang City

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Abstract

Introduction/Main Objectives: This study examines how technological adaptation influences the activities and development of Micro, Small, and Medium Enterprises (MSMEs) in the RW 04 Ketawanggede area of Malang City. As digital transformation accelerates, MSMEs face increasing pressure to adopt digital tools to enhance efficiency, expand markets, and remain competitive. Understanding this adaptation process is essential for identifying gaps and opportunities in local digitalization efforts.

Background Problems: The study addresses the central question: *To what extent does technological adaptation shape MSME performance, and what barriers hinder the digital adoption process among MSME actors in Ketawanggede?*

Research Methods: A descriptive qualitative method was employed, with data collected through in-depth interviews, field observations, and documentation involving five MSME actors in Ketawanggede. Data were analyzed using the Miles, Huberman, and Saldaña interactive model through stages of data reduction, data display, and conclusion drawing, supported by source and method triangulation.

Findings/Results: The study finds that MSMEs benefit from increased efficiency, improved communication, and broader market access when adopting digital tools such as WhatsApp, QRIS, and social media. However, elderly MSME actors experience significant barriers, including limited digital skills and reliance on informal learning, while government support in the form of training is largely absent. Digital adaptation thus progresses unevenly, driven mainly by consumer demands—especially students—and assistance from younger family members.

Conclusion: Technological adaptation plays a crucial role in strengthening MSME competitiveness, but the digital divide persists among actors with low digital literacy. Effective digital transformation requires targeted and inclusive interventions, particularly for elderly MSME owners. Strengthening localized digital literacy programs and providing structured mentoring can help ensure that MSME digitalization progresses more evenly and sustainably.

Keywords: technology adaptation, MSMEs, qualitative methods, digitalization, Ketawanggede Malang



Introduction

The development of digital technology in the last decade has brought significant changes to business patterns and human resource management, including in the Micro, Small, and Medium Enterprises (MSMEs) sector. Digital transformation is now a necessity for business actors to increase operational efficiency, expand market reach, and strengthen competitiveness in the era of technology-based economy (Hadi & Lestari, 2021; Rahmawati & Supriyanto, 2021). However, the process of adopting technology among MSMEs does not always run smoothly. Many business actors still face obstacles in the form of limited knowledge, digital skills, and the readiness of human resources to adapt (Kamilah & Arifin, 2023; Wulandari & Putra, 2021).

In Indonesia, MSMEs play a central role in the national economy. According to the Ministry of Cooperatives and SMEs (2024), the MSME sector accounts for more than 60% of GDP and absorbs around 97% of the workforce. However, the adoption rate of digital technology is still relatively low, especially for MSMEs in suburban and semi-urban areas, which tend to rely on conventional methods in running a business (Nugraha et al., 2022; Setiawan & Munandar, 2023). This inequality causes a significant difference in productivity between MSMEs that have adopted technology and those that have not (Ariana & Wijaya, 2023). This shows that digitalization does not only depend on the availability of technology, but is also determined by the readiness of human resources, motivation, and leadership patterns of business owners (Anatan & Nur, 2023; Purba & Siregar, 2020).

In the context of Malang City, the application of digital technology by MSMEs shows positive developments in line with the growth of the culinary and creative economy sectors that make extensive use of social media such as Instagram and TikTok as a means of promotion (Hakim & Mawardi, 2022; Amilia et al., 2024). Data from the Diskopindag shows that by the end of 2024 the number of MSMEs in Malang City will reach around 48 thousand units, an increase from the previous year (BPS Malang City, 2023; East Java Times, 2025). The local government has also implemented various digitalization programs, including digital branding training initiated by Diskominfo (Malangkota.go.id, 2024). However, the level of digital literacy of MSME actors in Malang City still varies, as found by Jibeka (2024) which shows that digital skills have not fully supported business operational needs.

Technological developments are also closely related to the culture of the people of Malang City, which is known as the city of education. Many students and the younger generation have made the use of digital applications such as TikTok, Instagram, WhatsApp, and QRIS part of their daily lives. This environment also influences local MSMEs to adapt (Santoso et al., 2025). However, not all MSME actors are ready for these changes. The elderly group is a group that is vulnerable to experiencing the digital divide due to limited understanding of technology (Antara Jatim, 2024). This condition requires more inclusive mentoring support, especially for MSMEs managed by elderly actors (Purnomo Sidi et al., 2024; Incorporation et al., 2024).

The Ketawanggedhe area in Malang City is an example of an area with fairly high MSME activity, including the culinary, handicrafts, and service sectors. Despite being close to the city center, some MSME actors are still in the process of utilizing technology such as social media, e-commerce platforms, and digital recording applications. Technology adaptation in this context is not only influenced by access and devices, but also by the readiness of human resources and individual understanding of the benefits of technology (Fadilla & Prakoso, 2022). Thus, an in-depth study of the technology adaptation process in Ketawang Gedhe MSMEs is important to understand the dynamics, obstacles, and strategies of human resources in facing the digital era.

Based on these conditions, this study focuses on the process of technology adaptation by MSME actors in Ketawang Gedhe Village, Malang City. Through a qualitative approach, this research aims to explore the experiences, perceptions, and strategies of MSME actors in adapting to technological developments. The results of the research are expected to provide an in-depth understanding of the role of human resources in the digitalization of MSMEs and become the basis for the formulation of more effective and inclusive MSME assistance policies in the future.

Research Methods

This study uses a **descriptive qualitative approach** with the aim of understanding in depth the process of technological adaptation carried out by Micro, Small, and Medium Enterprises (MSMEs) in Ketawang Gedhe Village, Malang City. This approach was chosen because it is able to reveal the meaning, experience, and subjective perception of business actors in dealing with changes in digital technology in their business activities (Creswell & Poth, 2018). In addition, this approach allows researchers to capture the dynamics of technological adaptation that is not only technical, but also related to human factors, such as motivation, obstacles, and the readiness of human resources—which is in line with the focus of the research results.

Location and Research Subject

The research was carried out in Ketawang Gedhe Village, Lowokwaru District, Malang City, which is one of the areas with quite diverse MSME activities, especially in the culinary, handicrafts, and service sectors. This location was chosen **purposively** because the area shows a variety of levels of technology utilization, ranging from business actors who already use social media and digital applications, to MSME actors who still face obstacles in adapting to technology.

The subjects of the study are micro and small business actors who run businesses in the Ketawang Gedhe area. The selection of informants uses a **purposive sampling technique** with the following criteria: (1) having been running a business for at least one year; (2) have experience using or attempting to use digital technology such as social media, digital payment systems, or business support applications; and (3) play an active role in the management of business operations. A total of **five key informants** were interviewed, consisting of business owners and individuals directly involved in the use of technology. The results of the interviews showed a variety of technological adaptability, ranging from actors who were quite proficient in using digital media to actors who were still experiencing obstacles, especially those who were elderly.

Data Collection Techniques

Data was collected through three main techniques, namely **in-depth interviews**, **direct observation**, and **documentation**.

1. **In-depth interviews** were conducted to explore the experiences and views of MSME actors related to the use of digital technology. The interview guide is prepared based on themes relevant to the research objectives, such as forms of adaptation, barriers, support, and perception of the benefits of technology.
2. **Direct observation** is carried out at business locations to observe technology use practices, business actors' interactions with digital devices, and operational situations related to the technology adaptation process.

3. **Documentation** is carried out by collecting photos of business activities, social media displays of MSME actors, and important records related to business activities.

These three techniques complement each other and help produce a comprehensive picture of the technological adaptation process of MSME actors in the field.

Data Analysis Techniques

Data analysis was carried out interactively referring to the Miles, Huberman, and Saldaña (2014) model, which included three stages:

1. **Data reduction**, which is the process of selecting, grouping, and simplifying the results of interviews and observations into thematic categories such as forms of technological adaptation, adaptation barriers, and human resource support.
2. **Data presentation** is carried out in the form of descriptive narratives and thematic matrices to identify patterns, relationships, and tendencies in each data category.
3. **Conclusion drawn/verification**, carried out repeatedly by checking the suitability of data and field findings. The verification process is also carried out by matching the pattern of findings with the informant's statements directly, so that the conclusions produced are consistent and can be accounted for.

This analysis technique is in accordance with the character of your research data which is narrative and describes the informant's real experience in technology adaptation.

Data Validity Test

To ensure the validity of the data, the study uses **data triangulation**, which is to check the consistency of data from various sources and data collection techniques. Triangulation was carried out by comparing the results of the interview with the observational findings, as well as matching them with supporting documents or relevant visual evidence. In addition, the researcher also triangulates sources by checking the suitability of information between informants. This step is done to ensure that the research findings are valid, reliable, and trustworthy.

Result

Informant Profile and Business Background

The results of the interviews show that MSME actors in RW04 Ketawanggede have diverse business characteristics, both in terms of business type and length of establishment. The interviewed informants consisted of:

- an electronics store owner who has been operating for 15 years with one employee,
- the owner of a laundry service that has been running for 5 years also with one employee,
- owner of a Nasi Martabak stall that has been operating for 11 years with four employees.

The variation in the duration of business establishment shows different levels of business maturity so as to provide a diverse technology adaptation experience.

Motivation in running a business also shows a distinctive orientation. Electronics store owners see opportunities from household needs and strategic locations near campus. Laundry owners take advantage of the opportunity because most of the residents are college students who

tend to choose practical services. Meanwhile, the owner of the Nasi Martabak stall is encouraged to serve unique culinary by taking advantage of the surrounding environment that is crowded with students. These findings show that location orientation and consumer needs are the main factors influencing the establishment of MSMEs in the region.

2. Utilization of Digital Technology by MSME Actors

2.1 Use of Digital Platforms

All MSME actors have utilized digital technology in their daily operational activities. The most widely used platforms are **WhatsApp** for customer communication and **QRIS** for ease of transactions. Two informants (electronics and laundry stores) only use WhatsApp and QRIS, while Nasi Martabak stalls also use **Shopee** as an additional marketing and transaction channel.

The informant stated that the use of the platform plays an important role in facilitating communication, facilitating transactions, and improving product marketing. One of the informants mentioned that technology helps reduce the risk of losing cash because I often forget to save money in: *"my money is safe because I personally often forget if there is money in the form of cash"* (Laundry informant). Meanwhile, the owner of the martabak business emphasized that most of the consumers are students who are used to digital technology so that the use of digital platforms accelerates services.

2.2 The Function of Technology in Business Operations

Digital technology is used for three main functions:(1) customer communication(2) payment transactions(3) marketing strategy

Electronics stores use WhatsApp for communication and marketing, while QRIS is the main transaction tool. Laundry owners emphasize the importance of digital transaction security as it reduces the risk of miscalculation or loss of cash. Meanwhile, culinary businesses utilize digital platforms to facilitate transactions while reaching a wider market through the marketplace.

In general, these findings show that digital technology has become an integral part of the MSME operational process, especially in the aspect of communication and payment which is now a modern service standard.

3. Digital Technology Adaptation and Learning Process

3.1 How MSME Actors Get to Know Digital Technology

MSME actors are familiar with digital technology through the influence of the social environment and operational needs. The electronics store informant said that he became interested in using digital technology after seeing many people around him switching to digital applications. Laundry informants know digital technology because consumers often ask about digital payment services, so they are encouraged to use it. Meanwhile, the martabak informant stated that the development of the times and the location of the business close to the university are strong driving factors for adopting digital technology: *"inevitably we have to follow the digitalization movement"*.

These findings suggest that external factors—especially consumers and the campus environment—have a significant influence on accelerating technology adoption in the region.

3.2 Learning Resources and Mentoring

In the early stages of using technology, MSME actors tend to rely on the help of the closest people. The electronics store is assisted by a friend, the owner of the laundry is assisted by his child, and the owner of the martabak is assisted by a colleague. This pattern indicates that technology learning in the context of MSMEs is more informal and based on social relationships.

3.3 Early Challenges in Using Digital Technology

Most MSME actors do not experience significant obstacles. Electronics stores say that digital technology is relatively easy and economical, while the owner of martabak considers that obstacles only appear in the early stages because they do not know the application, but are easy to learn over time. The laundry owner admits that it was a bit difficult at first because he was not yet used to digitalization, but he stated that the difficulty lessened once the intensity of use increased.

This analysis shows that the initial difficulties in using technology have more to do with habits than limitations in technical ability. In other words, adaptation goes hand in hand with regular use.

4. Obstacles and Challenges in the Application of Digital Technology

In general, MSME actors do not feel significant obstacles in the use of digital technology. The main obstacles that arise are precisely technical, such as device damage. The martabak informant emphasized that digital technology is actually very affordable—"whether you want to use it or not"—indicating that technology adoption is influenced by individual motivation and willpower.

However, the age aspect is a slightly influential factor, especially for laundry informants who stated that old age makes it take a little longer to adapt. However, he emphasized that operational needs made him "forced" to learn.

5. Support and Adaptation Strategy for MSME Actors

5.1 Lack of Government Support

All MSME actors stated that they had never received digitalization training from the government or related institutions. The martabak informant assessed that training is very necessary because many MSME actors are still in the stage of getting to know digital technology. This shows that there are policy gaps and a lack of government intervention at the local level.

5.2 Strategies to Stay Competitive

MSME actors place *technology updating* as the main strategy. All three informants have a similar view: they must keep up with technological developments so as not to be left behind and to be able to compete. The electronic store informant said, "*inevitably we have to keep updating*", while the laundry informant stated that if it is not updated, business actors will "fall". The martabak informant also revealed that technology continues to develop so that MSME actors must adapt.

5.3 The Role of Young People and the Family

All MSME actors stated that the assistance of the younger generation is very significant in the digitalization process. They assessed that young people better understand digital applications and are an important source of support in business management. The martabak informant even emphasized that he was very happy to be helped by young people because their role was important as the next generation.

6. Consumer Perspectives on the Use of Digital Technology

The results of interviews with consumers show that digital technology is very familiar and used every day, especially for purchase transactions. Consumers consider digital technology to be more "simple and easy to use". They use various platforms such as WhatsApp, Instagram, TikTok, Shopee, and QRIS.

Consumers are familiar with digital technology from the social environment, especially friends. In addition to convenience, the security aspect is also an important reason, because digital transactions reduce the risk of crime due to not having to carry large amounts of cash.

Consumers also consider that the role of young people in encouraging the digitalization of MSMEs is very large because the majority of them are used to using technology. They hope that the government pays more attention to MSME actors in the digitalization process, considering that not all business actors have equal capabilities.

7. Perspective of Community Leaders (Chairman of RW04)

The Chairman of RW04 emphasized that most people, including MSME actors, have known and used digital technology. However, there are still community groups that have not mastered technology, as evidenced by various reports of residents asking for help in registering digital applications and marketplaces.

The Chairman of RW04 also assessed that the community's adaptation to technology is driven by interaction with immigrant students who are the main consumers. He stated that MSME actors "inevitably have to follow the flow of digitalization development".

The role of local youth through youth organizations is also considered important in helping residents who do not understand digital technology. The Chairman of RW stated the need for periodic training from the government so that the community can develop and be more prosperous.

General Conclusions of Research Results

Overall, the results of the study show that the adaptation of MSME digital technology in RW04 Ketawanggede occurs naturally due to environmental encouragement, especially interaction with students as the main consumer. The level of technology acceptance is quite high, although some business actors still need assistance. The absence of formal training from the government is one of the main obstacles that need to be considered.

Discussion

The results of the research on the process of technology adaptation by MSME actors in Ketawang Gedhe Village show that the dynamics of the use of digital technology cannot be separated from the social context and characteristics of the business actors who are the subject of the research. Field findings show a variation in adaptability, forms of resistance, and

adjustment strategies that are in line with the phenomena that have been described in the background of the study.

First, the results of this study strengthen the argument in the background that the **development of digital technology does bring opportunities as well as challenges for MSMEs**. As reflected in the field findings, some MSME actors in Ketawang Gedhe show quite good technological adaptability, especially those who are of productive age and are used to using digital devices in their daily lives. This is in line with the general picture of Malang City as an educational city dominated by young people who are familiar with digital platforms such as Instagram, TikTok, and the use of electronic payment systems such as QRIS. This condition creates an environment that requires MSME actors to keep up with technological developments to remain relevant in the midst of an increasingly digital market.

However, the results of the study also show that the **biggest challenge in technology adaptation is actually experienced by elderly MSME actors**, as has also been mentioned in the background that the elderly group is one of the most vulnerable groups to the digital divide. The research informant revealed that the main difficulty is not only in the operation of the device or application, but rather in the lack of confidence and fear of making mistakes when using technology. This condition is consistent with national findings that show low digital literacy among the elderly, and is in line with the statement of the Malang City government through the Diskominfo regarding the urgency of increasing digital literacy for vulnerable groups. Thus, this study confirms that the **digital literacy gap is still the main obstacle in the digital transformation process of MSMEs**, especially in semi-urban areas such as Ketawang Gedhe.

Second, in the context of the business environment, the research findings support the data on the background that Malang City is experiencing a significant increase in the number of MSMEs as well as the intensification of digitalization programs by the government. However, field conditions indicate that the **increase in the number of MSMEs is not fully proportional to the level of technology utilization**. Some of the business actors encountered are still running conventional operations, including manual recording, word-of-mouth marketing, and cash transactions without utilizing digital platforms. These findings show that there is a gap between the government's efforts to encourage the digitalization of MSMEs and the readiness of human resources at the site level, as explained in the background that the factors of competence, training, and the role of business owners greatly determine the success of digital transformation.

Third, the findings of the study also corroborate the statement in the background that technological adaptation is not only related to the availability of devices, but is also influenced by the motivation, experience, and perception of business actors. MSME actors who have a business development orientation tend to have greater motivation to learn technology, even with limited capabilities. On the other hand, business actors who already feel stable with traditional methods tend to show resistance or are reluctant to switch to digital systems. This illustrates that **technological adaptation is a cognitive and affective process, not just technical**, and is in line with the literature on human resource management in MSMEs that emphasizes the importance of business owners' leadership patterns.

Fourth, the results of the study also show that digitalization has a real positive impact on MSME actors who are able to adapt, especially in marketing and transaction aspects. Informants who have used social media for promotion admit that consumer reach is increasing, while the use of QRIS and digital payments helps speed up the transaction process. This conclusion supports the background that digital technology functions as a tool to increase operational efficiency and strengthen competitiveness, especially in the culinary sector and the developing creative economy in Malang City.

However, this study also confirms the inequality **in technology implementation between MSME actors in the same region**, which shows that MSME digitalization is not a homogeneous process. This inequality can be caused by differences in education levels, age, previous technology experience, and access to training. Thus, these findings clarify the urgency of MSME assistance policies that focus more on differentiating needs, as has been hinted at in the background that human resource development strategies must be more directed.

Overall, the results of the study show that the phenomenon of MSME technology adaptation in Ketawang Gedhe is in line with the macro situation that has been presented in the background, but also provides a more specific picture of the dynamics that occur at the local level. Field findings provide an understanding that the success of MSME digitalization does not only depend on government policies or the availability of technology, but is highly determined by the readiness of human resources, especially business owners as the main actors in decision-making. Therefore, this study emphasizes the need for a more inclusive mentoring approach, especially for elderly MSME actors, so that digital transformation can run more evenly and sustainably.

Conclusion

This study concludes that technological adaptation by MSME actors in Ketawang Gedhe Village takes place unevenly and is greatly influenced by age factors, digital literacy, and individual motivation. Young or productive MSME actors tend to adopt social media and digital payments faster, while elderly MSME actors still experience obstacles in the form of limited understanding, awkwardness, and fear of new technologies. This condition is in line with the background of research that shows that even though Malang City is a rapidly developing environment, the digital divide still occurs in certain groups.

This finding has theoretical implications that technology adaptation in MSMEs is not only a matter of access to devices, but also a learning process related to the readiness of human resources. From a practical perspective, the results of the study show that general digital training has not been able to reach vulnerable groups such as the elderly. Therefore, personalized, gradual, and needs-based assistance is needed to accelerate the digital transformation process. Local governments, the MSME community, and academics have an important role in shaping an inclusive digital ecosystem.

The policy implications that emerge from this study emphasize the importance of preparing a tiered digital literacy program based on the level of ability of MSME actors. The Malang City Government needs to strengthen mentoring facilities at the sub-district level through digital cadres or field facilitators, as well as expand access to learning facilities such as digital training centers. More inclusive policies, especially for elderly MSME actors, are important to reduce the digital divide that is still clearly identified in the research area.

Based on these findings, this study suggests that MSME actors begin to use technology gradually according to their capacity, by involving family members or employees who are more competent in the use of digital devices. Governments and stakeholders are advised to strengthen practical training focusing on the use of social media, marketing applications, and digital payment systems. For further research, it is recommended to expand the study location and use a mixed method approach to obtain a more comprehensive picture of the level of digital literacy and its impact on the development of MSMEs.

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