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Challenges and Opportunities in Digital Technology Adoption among MSMEs in Jakarta

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ABSTRACT

In globalization and evolving consumer behavior, (Micro, Small, and Medium Enterprises) MSMEs must embrace digital technology to endure and remain competitive. This study aims to investigate the challenges and opportunities faced MSMEs in Jakarta in adopting digital technology utilizing the Diffusion of Innovation (DOI) theory framework. The methodology is using in-depth interviews with 25 MSMEs across diverse sectors. The analysis indicates that relative advantage is the primary motivator, as MSMEs stakeholders perceive digital technology to enhance market access, operational efficiency, marketing strategies, product innovation, and increase competitiveness and business sustainability. However, the technology's compatibility with the local work culture is not aligned, indicating that the drive to innovate is stronger. The opportunity to evaluate technology positively impacts adoption decisions. This study enhances comprehension of the dynamic's digital technology adoption by MSMEs.

Keywords: Adoption of digital technology; Jakarta MSMEs; MSMEs opportunities; MSMEs challenges; Diffusion of Innovations (DOI).

ABSTRAK

Di tengah globalisasi dan perubahan perilaku konsumen, Usaha Mikro, Kecil, dan Menengah (UMKM) perlu beradaptasi dengan teknologi digital agar mampu bertahan dan bersaing. Penelitian ini bertujuan untuk menganalisis tantangan dan peluang yang dihadapi UMKM di Jakarta dalam mengadopsi teknologi digital dengan pendekatan teori Diffusion of Innovation (DOI). Metode yang digunakan adalah kualitatif melalui wawancara mendalam dengan 25 UMKM dari berbagai sektor. Hasil analisis menunjukkan bahwa keunggulan relatif menjadi pendorong UMKM melihat teknologi digital dapat meningkatkan akses pasar, efisiensi operasional, peningkatan strategi marketing, inovasi produk, serta peningkatan daya saing dan keberlanjutan yang membuka jalan percepatan adopsi digital. Namun, kesesuaian teknologi dengan budaya kerja lokal tidak selaras, menandakan bahwa dorongan untuk berinovasi lebih kuat. Sebaliknya, kemungkinan uji coba teknologi memberikan pengaruh positif terhadap keputusan adopsi. Penelitian ini memberikan kontribusi pada pemahaman yang lebih mendalam tentang dinamika adopsi teknologi digital oleh UMKM.

Kata Kunci: Adopsi teknologi digital; UMKM Jakarta; Peluang UMKM; Tantangan UMKM; Diffusion of Innovations (DOI).

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INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) play an important role in the Indonesian economy, particularly in the Jakarta region, which is the national economic center. According to data from the Kementrian Koperasi dan UKM in 2023, MSMEs contributed approximately 61% to the national Gross Domestic Product (GDP) and employed 97% of the total workforce in Indonesia. Amidst the rapidly accelerating era of digitalization, the adoption of digital technology is key for MSMEs to enhance their competitiveness and survive in the dynamic business landscape.(Kementrian keuangan RI, 2024).

In the era of rapid digitalization, digital technology adoption has emerged as a key determinant of MSMEs competitiveness and survival. Digital tools enable MSMEs to expand market reach, enhance operational efficiency, and improve business performance through e-commerce platforms, digital payments, and data-driven to decision making (Bahtiar et al., 2025; Purnomo et al., 2024). International and regional studies consistently demonstrate that MSMEs adopting digital technologies experience higher productivity, revenue growth, and adaptive capacity compared to non-adopters (Deshpande et al., 2025; O'Mahony, 2025).

Jakarta, as the economic centre of Indonesia, holds a strategic position in driving the adoption of digital technology among MSMEs. Digital technology gives opportunities for MSMEs to expand their market reach, improve operational efficiency, and innovate in their products and services. A study by Deloitte (2021) shows that MSMEs adopting digital technology have the potential for revenue growth up to 80% higher compared to those that do not adopt it (O'Mahony, 2025).

Beyond competitiveness, digital technology adoption has also been shown to enhance organizational resilience and business sustainability. Studies of Indonesian MSMEs reveal that digitally enabled firms were better equipped to maintain operations, reorganize business models, and respond to rapid changes in consumer behavior during periods of economic disruption, such as the COVID-19 pandemic (Anatan, 2023; Purnomo et al., 2024). Digital platforms facilitate faster information exchange, improved supply chain coordination, and more flexible customer interaction, reinforcing the role of digitalization as a structural foundation for MSMEs sustainability rather than a short-term competitive strategy.

On the other hand, Indonesian government has introduced various initiatives to promote MSMEs digitalization, including digital onboarding programs, e-commerce integration, and fintech-based financing schemes. Nevertheless, empirical research suggests that the effectiveness of these initiatives varies significantly across regions and enterprise characteristics. Even in Jakarta, where digital infrastructure is relatively advanced, disparities in adoption persist, indicating that technological availability is insufficient to ensure adoption. Behavioral, organizational, and perceptual factors play a crucial role in shaping MSMEs decisions regarding digital technology implementation (Bahtiar et al., 2025; Utomo & Setiyono, 2024).

The development of digital technology is a major catalyst in the transformation of the MSMEs sector. Jakarta, with better digital infrastructure compared to other regions and widespread internet access, can serve as a barometer for the digital transformation of MSMEs in Indonesia (Anistia et al., 2025). However, MSMEs face pressure to adapt to digitalization to improve competitiveness and operational efficiency. The process of adopting digital technology doesn't always go smoothly. Many MSMEs face obstacles such as limited resources, low digital literacy, and lack of access to technology infrastructure and support (Evangeulista et al., 2023).

In analyzing the dynamics of digital technology adoption, the Diffusion of Innovation (DOI) theory developed by Everett Rogers explains that the spread and acceptance of innovation are influenced by five key characteristics: relative advantage, compatibility, complexity, trialability, and observability. These factors play a crucial role in determining the speed and rate of technology adoption by both individuals and organizations (Triandini et al., 2024).

Despite a growing of research on MSMEs digital transformation in Indonesia, studies focusing on Jakarta using a strong theoretical framework remain limited. Many existing studies rely on descriptive or national-level analyses, offering limited insight into how MSMEs evaluate digital innovations at the firm level. To address this gap, this study adopts the Diffusion of Innovation (DOI) theory, proposed by Rogers, which explains that technology adoption is influenced by five core characteristics: relative advantage, compatibility, complexity, trialability, and observability. Prior empirical research confirms the relevance of DOI in explaining digital adoption among Indonesian MSMEs, with certain attributes exerting stronger influence depending on contextual conditions (Triandini et al., 2024).

Based on the various conditions mentioned, the research question in this study is as follows:
Q1: What are the challenges faced by MSMEs in Jakarta?

Q2: What are the opportunities for MSMEs in Jakarta when adopting digital technology?
Q3: How do the factors in the Diffusion of Innovation (DOI) Theory influence the decisions of MSMEs in Jakarta to adopt digital technology?

This research aims to analyze the challenges and opportunities faced by MSMEs in Jakarta in adopting digital technology using the Diffusion of Innovation (DOI) theory. This research is expected to provide practical recommendations for MSME actors and policymakers to accelerate the digital transformation of MSMEs, especially in Jakarta.

LITERATURE REVIEW

Micro, Small, and Medium Enterprises (MSMEs) in Jakarta

Micro, Small, and Medium Enterprises (MSMEs) is a central role in Jakarta's urban economy, functioning as key drivers of employment, income generation, and local economic resilience. As Indonesia's capital city and economic hub, Jakarta concentrates a large proportion of national MSMEs activity, particularly within the trade, services, food and beverage, and creative economy sectors. Empirical studies consistently describe MSMEs as the backbone of Jakarta's economy, due to their capacity to absorb labor, stimulate entrepreneurship, and sustain economic activity in both formal and informal sectors (Judijanto et al., 2023; Yanto et al., 2025). Rapid population growth, high consumer density, and diversified demand create fertile conditions for MSMEs growth, while simultaneously increasing competitive pressure. Research on urban MSMEs in Jakarta highlights their dual role: generating economic dynamism while acting as a buffer against unemployment and income inequality in densely populated metropolitan areas (Marman Saputra & Darmawan, 2023).

Challenges Faced & Opportunities by MSMEs in Jakarta

The literature identifies several persistent challenges confronting MSMEs in Jakarta. Financial constraints remain a dominant issue, particularly limited access to affordable credit and formal financial institutions. Additionally, regulatory complexity and administrative burdens continue to hinder business formalization and scaling efforts ((Yanto et al., 2025). Technological barriers also feature prominently. Although Jakarta provides better infrastructure than other regions, many MSMEs struggle with low digital literacy, lack of technical expertise, and resistance to organizational change. Studies indicate that digital adoption is often driven by short-term survival needs rather than long-term strategic planning, resulting in partial or ineffective implementation of technology (Ratnaningtyas et al., 2025; TH. Tambunan & Busnetti, 2024).

Despite these challenges, Jakarta's MSMEs benefit from substantial opportunities arising from urban markets, digital ecosystems, and government intervention. Jakarta Provincial Government has implemented various MSME support programs, including entrepreneurship development initiatives, digital onboarding, licensing facilitation, and marketing support. Empirical evaluation of the **Jakpreneur** program demonstrates that marketing and licensing assistance significantly improve MSME profitability, particularly during and after periods of economic disruption (Krisnawati & Djamaluddin, 2023).

Furthermore, innovation-oriented strategies such as business partnerships, product diversification, and digital platform participation have been shown to positively influence MSMEs performance in Jakarta. Judijanto et al. (2023) find that strategic collaboration and diversification significantly enhance competitiveness and business outcomes among Jakarta MSMEs (Judijanto et al., 2023).

Diffusion of Innovation (DOI) Theory

The Diffusion of Innovation (DOI) theory developed by Everett Rogers (1962) is one of the most influential theoretical frameworks for understanding how innovations spread and are adopted within a social system. Rogers defines diffusion as the process by which an innovation is communicated through certain channels, over a specific period of time, among members of a social system. Innovation itself can be an idea, practice, or object that is considered new by an individual or group (Roger, 2003).

DOI emphasizes five key characteristics that influence the adoption rate of an innovation: relative advantage, compatibility, complexity, trialability, and observability. Various studies have tested the validity

of this theory in the context of digital technology. Sahin (2006) stated that DOI is a highly relevant framework for explaining technology adoption in education and organizations because it can accommodate social and psychological factors in the decision-making process. Meanwhile, MacVaugh and Schiavone (2010) highlight the limitations of DOI in addressing resistance to innovation, particularly in complex technological contexts and unsupportive social environments.

In MSMEs, DOI has been used to understand how small business owners adopt digital technology. A study by Triandini et al., (2024) shows that trialability has a positive and significant influence on technology adoption by MSMEs in Indonesia, while compatibility has a negative and non-significant influence. This indicates that the drive to change and innovate is stronger than the attachment to old practices.

RESEARCH METHODS

This study adopts a qualitative research approach employing a multiple case study design to explore the adoption of digital technologies among Micro, Small, and Medium Enterprises (MSMEs) in Jakarta. This design enables an in-depth examination of how MSMEs perceive, evaluate, and adopt digital innovations under varying organizational and environmental conditions. The qualitative approach was chosen because it allows for rich and exploration of complex phenomena such as digital technology adoption (Cresswell & Cresswell, 2018).

The analytical framework of this study is grounded in Diffusion of Innovation (DOI) theory, as proposed by Rogers, which posits that innovation adoption is influenced by five key attributes: relative advantage, compatibility, complexity, trialability, and observability. Each MSMEs represents an individual unit of analysis, and a cross case analytical strategy is applied to identify recurring patterns and divergences across cases.

The study was conducted in Jakarta, Indonesia's primary economic and digital hub, characterized by intense market competition and relatively advanced digital infrastructure. Its provides a relevant setting for examining digital technology adoption among MSMEs. Informants were selected using purposive sampling. The inclusion criteria were:

1. MSMEs operating in Jakarta
2. MSMEs that had adopted or were in the early stages of adopting digital technologies
3. Business owners or managers directly involved in strategic decision-making, and willingness to participate in in-depth interviews.

This research was conducted on 25 MSMEs spread across various regions in Jakarta, consisting of various types of MSMEs sectors: food & beverage, textiles, fashion, and electronics.

Primary data were collected through semi-structured, in-depth interviews guided by the five DOI attributes. Interviews lasted between 45 and 90 minutes and were audio-recorded with consent, then transcribed verbatim. Secondary data such as digital platforms and business profiles were also examined to support triangulation. All participants were informed about the research purpose, confidentiality was guaranteed, and participation was voluntary.

RESULTS AND DISCUSSION

A. Challenges Faced by MSMEs in Adopting Digital Technology

This section presents research findings on the various challenges encountered by business owners in adopting digital technology, based on in-depth interviews with 25 MSMEs founders in Jakarta. The qualitative data analysis from these interviews effectively categorized the challenges into five primary groups. This categorization provides a comprehensive overview of existing barriers, ranging from limitations in Human Resources (HR), challenges in competition and digital marketing, constraints in costs and infrastructure, concerns about digital security, and issues in platform integration and efficiency.

1. Limitations in Human Resources (HR) and Digital Literacy

Based on the results of in-depth interviews conducted with 25 people, limitations in human resources (HR) and digital literacy were identified as one of the most fundamental and significant challenges faced by MSMEs. This group encompasses various barriers related to low understanding, difficulty in employee

adaptation, the need for training, and limitations in competent human resources in the field of digital technology.

Table 1. Limitations in Human Resources (HR) and Digital Literacy

Respondent	Statement
1	"Providing guidance to new employees on how to use the technology being adopted by my business."
6	“The most common challenge in implementing digital technology is that we must be able to provide maximum and effective training and guidance on the use of digital technology to employees, as not all employees are digitally literate, requiring extra effort to improve human resource quality”.
7	"The way of communication and learning between employees is somewhat difficult to accept."
12	"Many human resources are not yet proficient in keeping up with digital developments. Quality human resources tend to be more expensive to recruit as employees."
13	"Lack of human resources capable of operating digital technology."
14	"Lack of digital literacy and adaptation among older employees."
17	Sometimes there are obstacles in employees' fluency in using digital facilities, which is why digital training is highly needed."
21	"Many customers still use cash
22	"Some of my employees still haven't adapted to using digital technology."

Source: Authors data analysis, 2025

Nine MSMEs actors stated that human resource (HR) limitations are the main challenge in managing MSMEs. Human resources are a significant obstacle to the adoption and implementation of digital technology due to low literacy, lack of technical skills, and resistance to change from conventional to digital methods. This is in line with the statement by (Fajriyani et al., 2023) that the human resource management process has become more complex and diverse. Furthermore, employee resistance to this transformative change was identified, compounded by the infrequent and unsystematic integration of digital technology in daily tasks.
It was stated by Resource Persons 14, 17, and 22 that the biggest obstacle they faced was related to the fluency of employees in using digital technology. This is due to the advanced age of the employees and the fact that the majority of them are middle and high school graduates. This problem is influenced by the low literacy rate of the community since primary education. The issue of literacy is a fundamental problem that demands serious attention in Indonesia. In recent decades, Indonesia's national competitiveness level has exhibited a declining trend in the context of global dynamics. This phenomenon indicates that Indonesia is in a literacy crisis, particularly in the aspects of reading and writing culture (Nirmala, 2022).

Human resource limitations are not solely influenced by employee background but also related to consumer conditions. As stated by Speaker 21, there are still a number of consumers who tend to use cash payment methods, particularly the elderly to their unfamiliarity with or do not have access to digital banking services such as mobile banking. Based on the experience of elderly users, several significant barriers were identified in the use of mobile banking applications. These challenges include difficulties understanding the login procedure, limitations in remembering PINs, and a tendency to choose simpler authentication methods, such as biometric systems. Factors such as a lack of digital literacy and low self-confidence are also major obstacles to the adoption of digital financial services among the elderly (Msweli & Mawela, 2021).

2. Challenges in Competition and Digital Marketing

According to the findings from comprehensive interviews with 25 individuals, the challenges related to competition and digital marketing were most commonly encountered by MSMEs participants. This challenge was explicitly identified by Respondents 3, 4, 5, 8, 9, 19, and 25.

Table 2. Challenges in Competition and Digital Marketing

Respondent	Statement
3	"There's a lot of competition and advertising costs are high.”
4	Yes, the high level of competition and overly cheap promotions lead to a lot of price dumping, but profits are low."
5	"There are many similar products and also excessive promotions via social media."
8	"MSMEs challenges include limited knowledge about digital platforms and how to use them effectively for promotion and sales. Additionally, the cost of adopting technologies like e-commerce or payment applications can be a barrier. Digital infrastructure, like unstable internet connections, can also hinder business operations. On the other hand, the lack of skilled human resources in technology and resistance to change from traditional business methods are feared to slow down my business digitalization process”.
9	"The challenge in adopting digital technology is that we must be digitally literate so that we understand the use of digital technology comprehensively. Additionally, competition in digital technology is increasing, so we need to understand which products are suitable for digital marketing and our target audience”.
19	The challenge is the high level of competition."
25	"Simplifying various types of different platforms to streamline marketing and sales tasks and execution”.

Source: Authors data analysis, 2025

Seven SMEs speakers in Jakarta indicated that competition and digital marketing pose challenges to the development of their SMEs. Speaker number 3 mentioned that the current high level of competition and expensive promotion costs are the biggest obstacles to product development. This is supported by the statement of (Suastriani & Haryati, 2021) that the level of competition in the business is becoming increasingly intense, so companies with optimal performance are able to survive. This is supported by effective promotional strategies, a rapid and focus distribution network, and superior product quality. In the process of achieving sustainability, companies are required to face various challenges through careful planning. These challenges include operational, financial, and marketing aspects of the products produced.

Challenges in competition and other digital marketing were presented by Speakers 4, 5, and 19. The speakers stated that currently, many similar products are proliferating both online and through conventional marketing. The necessity to innovate became a challenge in itself for them (Aprillia & Subiyantoro, 2022) stated that digital disruption poses challenges for conventional industry players due to the emergence of new competitors. This makes it difficult for older industries to compete directly. Therefore, the utilization of digital technology needs to be optimized to effectively support competitiveness.

3. Constraints in Costs and Infrastructure

According to the findings from comprehensive interviews with 25 individuals, challenges related to cost and infrastructure were significantly felt by several respondents. According to the interviews, these obstacles or challenges were directly experienced by respondents 3, 8, and 15.

Table 3. Constraints in Costs and Infrastructure

Respondent	Statement
3	“There's a lot of competition and advertising costs are high."
8	“My MSMEs challenges include limited knowledge about digital platforms and how to use them effectively for promotion and sales. Additionally, the cost of adopting technologies like e-commerce or payment applications can be a barrier. Digital infrastructure such as unstable internet connections can also hinder business operations. On

	the other hand, there are concerns about the lack of skilled human resources in technology and resistance to change from traditional business methods".
15	"High administrative costs on e-commerce platforms".

Source: Authors data analysis, 2025

Based on the analysis results, the main challenges faced by MSMEs regarding cost and digital infrastructure constraints indicate significant obstacles to technology adoption. Statements from multiple sources support this finding, identifying cost as the primary obstacle. Resource Person number 3 and Resource Person number 15 highlighted the high advertising and administrative costs on e-commerce platforms, which directly cut into profit margins. Additionally, Speaker number 8 added the unstable cost of adopting digital technologies and infrastructure, such as internet connectivity, also poses a real constraint on business operations. According to (Mei Hapsari & Eddy Sarwono, 2024)administrative costs, or admin fees, are a crucial component of a seller's operational cost structure on e-commerce platforms. This component includes various elements, such as transaction fees, service charges, and costs associated with using special features provided by the platform. Although administrative costs on some e-commerce platforms are considered high, this serves a purpose, one of which is to maintain service quality.

4. Challenges in Digital Security

In-depth interviews with 25 individuals revealed that certain respondents experienced notable digital security challenges. Respondent 2 directly encountered these obstacles or challenges, as indicated by the interviews.

Table 4. Challenges in Digital Security

Respondent	Statement
2	"Fear of cyber threats and data breaches is a barrier for many MSMEs to transition to digital solutions".

Source: Authors data analysis, 2025

Based on the statement from source 2, the main challenge faced by MSMEs in adopting digital technology lies in the aspect of data security. The speaker emphasized that the threat of customer information leaks and the potential for misuse of business accounts are factors that raise concerns when conducting online business activities. This finding shows that the limited understanding of MSMEs actors regarding data protection systems and cybersecurity practices leads to significant vulnerabilities. This aligns with the literature stating that low digital literacy contributes to the high risk of cyber security in the MSMEs sector (Soetam et al., 2025).Thus, it can be concluded that digital security is not just a technical issue, but also a managerial problem that requires increased awareness and more systematic risk mitigation strategies.

5. Platform Integration and Efficiency Issue

According to the findings from comprehensive interviews with 25 individuals, integration and efficiency emerged as the primary challenges for certain MSMEs participants. Based on the interviews, Respondents 11, 23, and 24 directly encountered these obstacles or challenges.

Table 5. Platform Integration and Efficiency Issue

Respondent	Statement
11	"This year, changes in the digital world, especially in AI, are very rapid, and we are starting to adopt AI technology to keep up with the times in our business."
23	"The first challenge for my MSMEs in implementing digital technology is that it's not very accessible if potential customers don't know about our products. Because in my opinion, even if we use technology but it's not known by our closest people, it's the same as not having any buyers."

24	"The challenge is to learn quickly about various supporting applications so that the products we are going to sell are more attractive to look at and easy for potential buyers to find."

Source: Authors data analysis, 2025

One of the main challenges faced by MSMEs in adopting digital technology lies in the aspect of platform integration and efficiency. Resource person number 11 stated that the rapid technological changes, particularly those related to artificial intelligence (AI), require business owners to adapt immediately. This indicates that adopting new technologies requires not only infrastructure readiness but also good integration to support the sustainability of business operations (Hasan et al., 2025).

Meanwhile, source number 23 emphasized that although digital technology is already being used, its effectiveness is still limited if it cannot reach consumers optimally. The lack of integration between technology usage and marketing strategies has resulted in the products offered not being widely known, even within the closest circles. This condition indicates that the platform's efficiency has not been maximized, and therefore, the use of technology has not had a significant impact on improving business competitiveness (Qauzilqist & Lestari, 2025).

Speaker number 24 added that another challenge is the necessity of learning various supporting applications to make the products sold easier to find and more attractive to potential buyers. This indicates an urgent need to improve the integration capabilities of various digital features to create efficiency in product promotion and distribution (Wang, 2024)

Overall, the findings from the three sources indicate that platform integration and efficiency issues are crucial obstacles for MSMEs. The lack of ability to connect new technologies with market needs, coupled with limitations in optimally utilizing digital features, impacts the low effectiveness of using e-commerce platforms in supporting business success.

B. Opportunities Gained by MSMEs from Digital Technology Adoption

Based on interviews conducted with 25 MSMEs actors in Jakarta, this study identifies various opportunities gained by MSMEs through the adoption of digital technology. The findings were then classified into five main opportunity groups, which will be explained in detail below.

1. Market Expansion and Consumer Access

According to the findings from comprehensive interviews with 25 individuals, opportunities for market expansion and access to consumers were mentioned by Informants 1, 2, 7, 11, and 13.

Table 6. Market Expansion and Consumer Access

Respondent	Statement
1	“It makes it easier for us to reach more opportunities”
2	“Brands can more easily reach consumers across Indonesia, selling to all segments ofsociety."
7	"It expands the reach of their products to overseas markets,increases revenue, and achieves broader growth."
11	"The opportunity is thatwe can open up a wider marketing reach, both within the Jakarta regionand outside of Jakarta."
13	The opportunity to reach consumers in various parts of the country."

Source: Authors data analysis, 2025

The interview finding that the adoption of digital technology provides significant opportunities for MSMEs in terms of market expansion and consumer access. The speaker emphasized that digitalization makes it easier for business owners to reach a wider range of opportunities (N1) and allows brands to be accessible to all segments of Indonesian society (N2). Additionally, digitalization also opens up opportunities for expansion into international markets, which impacts increased turnover and business growth (N7). Another speaker highlighted that this opportunity is not limited to specific regions, but can expand marketing reach both in Jakarta and outside Jakarta (N11), even reaching consumers in various parts of the country (N13). Thus,

digitalization has proven to be a major catalyst for MSMEs in expanding their marketing networks, increasing consumer access inclusivity, and creating more sustainable business growth. This finding aligns with research showing that by leveraging digital technology, MSMEs are able to enhance their ability to detect and capitalize on opportunities in international markets and reconfigure resources more effectively, thus strengthening the link between digitalization and the trend of expansion into global markets (Qiao et al., 2024).

2. Operational Efficiency and Business Management

Based on the results of in-depth interviews conducted with 25 people, opportunities regarding operational efficiency and business management were mentioned by Respondents 1, 2, 7, 11, and 13.

Table 7. Operational Efficiency and Business Management

Respondent	Statement
3	"Finance is clearly organized, making transactions easier."
5	"It's very good for increasing profits and controlling finances."
17	"Operational efficiency in terms of both time and cost."
18	"Knowing how to use digital tools and manage finances."
19	"It help reduce unnecessary costs."

Source: Authors data analysis, 2025

The source indicate that the system significantly improves operational efficiency and business management. Operational efficiency is reflected in the system's ability to save time and costs, which is directly acknowledged by Sources 17 and 19. Meanwhile, business management is strengthened through improved financial control, as mentioned by Source 5, where the system helps increase profits and control expenses. Additionally, this system also facilitates digital transformation for its users, helping them understand and manage their finances more structured and organized, as stated by sources 3 and 18. It was revealed by (Rahman Hakim et al., 2024) that the digitalization of financial statements is one effective solution to help MSMEs. Digitalization report facilitate financial management becomes easier, faster, and more accurate, enabling business owners to make better informed business decisions.

3. Enhancement of Digital Marketing Strategies

Based on the results of in-depth interviews conducted with 25 people, opportunities for improving digital marketing strategies were mentioned by Informants 4, 6, 9, 12, and 15.

Table 8. Enhancement of Digital Marketing Strategies

Respondent	Statement
4	"Easy promotion use digital technology, many people know about the my MSMEs."
6	"I can go live, so there are many sales."
9	"The opportunities for promotion are becoming easier."
12	“I can also create promotions on various social media with unique and interesting content that I hope can attract the attention of old customers or attract new customers."
15	"The opportunities for my MSMEs in adopting digital technology are very big, especially in increasing market reach through e-commerce platforms and social media. By utilizing digital marketing, I can reach new customers outside the local area and significantly increase sales. In addition, digital technology enables operational efficiency, such as online ordering and digital payment systems, which can facilitate transactions and improve customer satisfaction. I can also collect customer data to develop more targeted marketing strategies, increase loyalty, and business competitiveness."

Source: Authors data analysis, 2025

The adoption of digital technology present significant opportunities for improving marketing strategies. Respondents numbers 4 and 9 briefly stated that digitalization makes promotion easier, meanwhile respondent number 6 mentioned the direct benefit, which is *"being able to go live leads to many sales,"* indicating the great potential of direct digital promotion. Furthermore, speaker 12 highlighted the ability to create unique and engaging promotions on various social media platforms to reach new customers and retain existing ones. According to (Evangeulista et al., 2023)the concept of the digital economy through innovative business models, as demonstrated by the speakers' experiences. The utilization of digital technology not only simplifies promotion and increases sales but also fosters fiercer competition. The speakers, particularly speaker 15, demonstrated how MSMEs can compete with large industries by leveraging customer data and more targeted marketing strategies. Consequently, digitalization provides MSMEs with the tools to expand market reach, significantly increase sales, and strengthen customer loyalty through more focused and data-driven marketing strategies.

4. Product and Service Innovation

According to the findings from comprehensive interviews with 25 individuals, opportunities for product and service innovation were mentioned by Respondents 10, 20, 21, 22, and 24.

Table 9. Product and Service Innovation

Respondent	Statement
10	"Everything becomes more organized, systematic, documented, and efficient."
20	"You can centrally order, manage, and control raw material needs for production and product distribution using digital technology."
21	It's very helpful for transactions (cashless), highly efficient bookkeeping, employee data (salary, attendance), promotion through social media, and collaborating with other MSMEs."
22	"The opportunity is to occasionally offer discounted prices to attract customers."
24	"There are many supporting applications that make it easier for us to create a product portfolio that we will sell to increase the interest of potential buyers, and the entire process from seller offering to delivery is greatly assisted by the convenience of digital technology."

Source: Authors data analysis, 2025

The source indicate that the adoption of digital technology presents significant opportunities for product and service innovation, aligning with the concepts of process and product innovation. Process innovation is demonstrated from the experiences of sources numbers 10 and 20, who emphasized systematization, centralized control, and the utilization of technology to optimize internal processes, from production to distribution. Meanwhile, product and service innovation is realized through improved customer experience, such as the convenience of cashless transactions and smooth delivery, highlighted by speakers 21 and 24. Additionally, digital technology also enables the implementation of new strategies, as acknowledged by speakers numbers 22 and 24, who utilize applications to enhance their product portfolios and offer dynamic promotions. This indicates that the innovation occurring not only creates new products but also encompasses changes in work methods, marketing strategies, and business models to achieve better efficiency and competitiveness.

5. Improvement of Competitiveness and Business

According to the findings from comprehensive interviews with 25 individuals, pportunities for improving competitiveness and business sustainability were mentioned by Respondents 10, 20, 21, 22, and 24.

Table 10. Improvement of Competitiveness and Business

Respondent	Statement
8	"Towards a global trend"
14	"Gaining more opportunities for clients and customers in the future"
16	"More business opportunities by using innovations in business

	opportunities"
23	The struggle here is building many relationships because if we don't have relationships, it's harder to develop this business."
25	"Being able to identify various types of consumers makes it easier to develop efficient marketing strategies for acquiring and serving existing, new, and potential customers well."

Source: Authors data analysis, 2025

Increased competitiveness is reflected in the ability of MSMEs to "go global" and gain "more clients and customers," thereby creating new business opportunities through innovation. Meanwhile, business sustainability is strengthened by the ease of building "relationships" with customers and the ability to "identify various types of consumers," which is crucial for developing more efficient marketing strategies. Thus, digital technology not only helps businesses compete in a wider market but also ensures their survival by building stronger and more targeted relationships with customers (Widya Astuti et al., 2023).

C. Analysis of Adoption Technology Based on the Diffusion of Innovation (DOI) Theory

In line with Everett Rogers' Diffusion of Innovation (DOI) Theory, relative advantage is crucial determinant in the adoption of digital technology. Numerous MSMEs participants in Jakarta are transitioning to digital technology due to advantages such as management and operational efficiency, product innovation, improved marketing strategies, increased competitiveness and business sustainability, and expanded market access. However, technology adoption doesn't always go smoothly. The compatibility between technology and local work culture poses a unique challenge. Some MSMEs still maintain traditional ways of working and feel that digital technology is not entirely compatible with the systems they have built over the years. Based on a study conducted by (Triandini et al., 2024) it was found that compatibility actually has a negative and non-significant influence on technology adoption by MSMEs in Indonesia. This shows that the drive to change is often stronger than the desire to maintain old habits.

Complexity is also one of the barriers. Technology that is considered complex or requires special skills is often avoided. Some MSMEs explained that they face limitations in terms of human resources, marketing competition, costs and infrastructure, digital security, and platform integration and efficiency. Therefore, technology providers need to design simple and easy-to-use solutions to make them more readily accepted.
On the other hand, the possibility of the trial proving highly influential. Some MSMEs stated that when given the opportunity to try out technology first through a demo version or free trial, they are more confident in adopting a technology. A study by (Triandini et al., 2024) shows that trialability has a positive and significant influence on adoption decisions.

CONCLUSIONS AND RECOMMENDATIONS

Five characteristics of DOI in analyzing the opportunities and challenges faced by MSMEs, it can be concluded that the adoption of digital technology is not merely a technical issue, but a social and strategic process influenced by perception, organizational readiness, and the external environment. MSMEs' decision to adopt digital technology is significantly shapes by their interpretation of change, assess risk, and response to market dynamics. In Jakarta, as the center of economic and digital activity, MSMEs encounter demands for efficiency alongside increasingly complex competition, human resource limitations, challenges in platform integration, and the necessity for sufficient digital security. Therefore, a holistic and inclusive strategy is required that considers the diversity of sectors, digital literacy levels, organizational capacity, and exising supporting ecosystems.

Sustainable digital transformation is attainable when the technology provides functionally relevant, accessible, comprehensible, and internalized by MSMEs. Technology providers, the government, and supporting institutions must collaborate to develop adaptive solutions, providing safe testing grounds and strengthening success narratives through local case studies and real testimonials. Thus, the adoption of digital technology by MSMEs serves not only as a reaction to evolving circumstances but also as an economic development strategy that empowers business owners as the main actors in the digital ecosystem.

For future research, it is recommended that the approach used be more in-depth and contextual. Research can be conducted by providing an overview of changes in adoption behavior over time, or segmentation by industry sector will enrich the analysis with a more specific perspective. Additionally, integrating the

Technology-Organization-Environment (TOE) framework can help understand the role of the external environment, such as government support and the digital ecosystem. However, this research not only contributes theoretically to the study of technology adoption studies but also provides space for the development of more relevant and impactful policies and implementation strategies for MSMEs in Jakarta or other urban areas.

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