

Digital Transformation in the Halal Industry Ecosystem: A Study of Halal MSMEs in Pekanbaru City

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ABSTRACT

Keywords:

Digital
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Background: Digital transformation is a critical factor in the development of halal micro, small, and medium enterprises (MSMEs) in the digital economy era, as it can improve business efficiency, expand market access, and strengthen the halal industry ecosystem. However, its implementation still faces various obstacles, such as low digital literacy, limited human resources, and suboptimal technology utilization.

Research Gap: Various previous studies have examined digital transformation in MSMEs as well as halal industry development; however, most have focused on the impact of digitalization on business performance, digital marketing, or technology adoption in general. Research specifically examining digital transformation as a factor strengthening the halal industry ecosystem, particularly among halal MSMEs at the regional level, remains relatively limited. In addition, previous studies have predominantly used quantitative approaches, which have not been able to provide an in-depth depiction of the experiences, strategies, and challenges faced by halal MSME actors in implementing digital transformation.

Novelty: This study uniquely examines digital transformation as a factor strengthening the halal industry ecosystem among halal MSMEs at the regional level in Pekanbaru City, using a qualitative case study approach with the Technology-Organization-Environment Framework as the main conceptual framework and integrating Islamic economic values of amanah, hisbah, and maslahah.

Method: This study employs a qualitative approach with a case study design involving six halal MSMEs in Pekanbaru City selected through purposive sampling. Data were collected through in-depth interviews, observation, and documentation, then analyzed using the interactive model of Miles, Huberman, and Saldaña, with data validity tested through source triangulation, method triangulation, and member checking.

Results: Digital transformation has been implemented through the use of social media, marketplaces, digital payment systems (QRIS), and communication applications to support business activities. This implementation has generated positive impacts, including expanded market reach, improved transaction efficiency, easier communication with consumers, and increased transparency of halal product information. Factors driving digital transformation include changes in consumer behavior, the development of digital technology, and training support. Meanwhile, the main obstacles encountered are low digital literacy, limited human resources, and suboptimal utilization of technology in business management.

Conclusion: Digital transformation contributes to strengthening the halal industry ecosystem by expanding market access, improving business efficiency, and reinforcing consumer trust in halal products. Therefore, optimizing digital transformation is an important factor in enhancing the competitiveness of halal MSMEs and supporting the sustainable development of the halal industry.

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INTRODUCTION

Digital transformation has become one of the primary drivers of change in the global economic system. The development of information, communication, and internet technology has changed the way businesses conduct their operations, ranging from production and marketing to distribution and consumer service processes (Faturrahman, Ega Saiful Subhan, 2025). Digitalization is no longer regarded merely as a technological innovation, but has evolved into a business strategy capable of improving operational efficiency, expanding market access, accelerating decision-making processes, and strengthening business competitiveness amid increasingly competitive economic conditions (F. A. Siregar et al., 2026). In Indonesia, digital transformation holds strategic significance because the national economic structure is dominated by micro, small, and medium enterprises (MSMEs) (Faturrahman, Ega Saiful Subhan, 2025). According to data from the Ministry of Cooperatives and Small and Medium Enterprises of the Republic of Indonesia, there are approximately 65 million MSMEs contributing around 60% to national gross domestic product (GDP) and absorbing more than 97% of the workforce (PEREKONOMIAN & INDONESIA, 2025). This substantial contribution demonstrates that the success of MSME digitalization will directly affect national economic growth. Along with the increasing use of e-commerce, social media, digital payment systems, and various internet-based business platforms, digitalization has become an opportunity for MSMEs to expand markets, increase productivity, and strengthen the sustainability of their businesses (Mirza Yuniar Isnaeni Mara, 2025).

From the perspective of sharia economics, digital transformation plays an increasingly important role as the halal industry develops into one of the priority sectors of national development (Puteri et al., 2025). Indonesia has significant potential in developing the halal industry, supported by the world's largest Muslim population and rising demand for halal products and services (Keuangan & Indonesia, 2023). According to the State of the Global Islamic Economy Report, global consumption of halal products continues to increase in the food and beverage, Muslim fashion, cosmetics, pharmaceutical, media, and halal tourism sectors (Hendri Hermawan Adinugraha, 2022). This condition opens opportunities for Indonesian businesses to expand their markets through the utilization of digital technology (Ummi Duwila, Fredy Hendry Louhenapessy, Bin Raudha Arif Hanoebioen & Ridhwan Assel, 2025). In this context, digital transformation is not only utilized as a marketing and transaction medium, but also plays a role in strengthening the halal value chain, increasing product information transparency, expanding market access, and building consumer trust in halal products (Cory Vidiati, 2026). Therefore, digitalization has become one of the important instruments in building a more integrated and sustainable halal industry ecosystem (FOSSEI, 2025).

As part of the halal industry ecosystem, halal MSMEs occupy a strategic position as the primary producers of various halal products and services consumed by the public. However, the implementation of digital transformation among halal MSMEs still faces various challenges (Suciati, Eva Dwi, 2025). Some business actors have utilized social media, marketplaces, digital payment systems, and business management applications in operating their businesses, while others still face limitations in digital literacy, human resource quality, technology access, and capital (M. R. Siregar et al., 2026). This condition is also found among halal MSMEs in Pekanbaru City, which is one of the economic growth centers in Riau Province with fairly rapid MSME development, particularly in the food and beverage, Muslim fashion, trade, and creative industry sectors. Although the local government continues to encourage MSME digitalization, the level of digital technology adoption still varies, meaning that not all business actors have been able to optimally integrate digital technology into their business processes. These differences in readiness levels indicate that digital transformation has not yet fully strengthened the halal industry ecosystem at the regional level.

Various previous studies have examined digital transformation in MSMEs as well as halal industry development; however, most have focused on the impact of digitalization on business performance, digital marketing, or technology adoption in general (Permadi et al., 2025). Research specifically examining digital transformation as a factor strengthening the halal industry ecosystem, particularly among halal MSMEs at the regional level, remains relatively limited. In addition, previous studies have predominantly used quantitative approaches, which have not been able to provide an in-depth depiction of the experiences, strategies, and challenges faced by halal MSME actors in implementing digital transformation. Based on this gap, this study aims to analyze the implementation of digital transformation among halal MSMEs in Pekanbaru City, identify the factors that support and hinder the digitalization process, and explain its contribution to strengthening the halal industry ecosystem. The findings of this study are expected to enrich the discourse on digital transformation from a sharia economics perspective, as well as serve as a recommendation for local governments, MSME actors, and stakeholders in formulating sustainable digitalization strategies for halal MSMEs.

METHOD

This study applies a qualitative approach with a case study design to obtain an in-depth understanding of the implementation of digital transformation within the halal industry ecosystem among halal MSMEs in Pekanbaru City (Afriyanti, 2024). This approach was chosen because it is able to reveal the experiences, perceptions, and strategies of MSME actors in utilizing digital technology as part of business development (Rinastiti et al., 2026). The research was conducted in Pekanbaru City, Riau Province, which was selected due to its fairly rapid growth of halal MSMEs, supported by the development of sharia economics and business digitalization (Afriyanti, 2025). Research informants were determined using a purposive sampling technique, with the criterion of halal MSME actors who had utilized digital technology in their business activities, such as social media, marketplaces, digital payment systems, and business support applications. The informants in this study included: Hojicha, Sambal Pecel Khamu, Jellins Cookies, Maswook Coffee, Manggleng Mbak Esti, and Jajanan AA Eka.

The number of informants in this study was determined based on the principle of data saturation rather than a predetermined sample size, with data collected iteratively by comparing information from each informant until subsequent interviews and observations no longer generated substantive new information, themes, or categories related to digital transformation implementation, organizational readiness, human resource capacity, consumer behavior, external environmental support, and the application of Islamic economic values; after the sixth informant, the findings showed repetition of the key themes without the emergence of substantively different categories, indicating that data saturation had been achieved and that the six selected cases provided sufficient depth of information to analyse the digital transformation of halal MSMEs within the dimensions of the Technology–Organization–Environment (TOE) Framework.

This research uses the Technology–Organization–Environment (TOE) Framework as the main conceptual framework in the development of research instruments, data grouping, and findings analysis. The Technology Dimension is used to explore the readiness and utilisation of digital technology by halal SMEs. The Organization Dimension focuses on the internal readiness of the organization, including management support, human resources, and the organization's capacity to adopt technology. Meanwhile, the Environment dimension is used to analyse the influence of external factors such as competition, customer needs, government support, and the halal industry ecosystem on the digital transformation process. Thus, the TOE Framework not only serves as a theoretical foundation but also becomes a systematic guide in the development of instruments, coding processes, data categorisation, and interpretation of research results.

Data collection was conducted through in-depth interviews, observation, and documentation. Semi-structured interviews were used to explore informants' experiences and views regarding the digital transformation process implemented in their business activities (Tedi Priatna, Bayu Bambang Nurfauji, Dewi Nuraeni, Eli Setia Mukti Sari, Putri Salsabilah Agasha, 2025). Observation was conducted to directly examine the practice of digital technology utilization in MSME business activities, while documentation was used as supporting data, including business profiles, digital promotional media, social media accounts, product catalogs, and other documents relevant to the research focus (Mokoagow

et al., 2026). Data collection was carried out until data saturation was reached, that is, when the information obtained became repetitive and no longer produced new findings.

Data analysis referred to the interactive model of Miles, Huberman, and Saldaña, which includes the stages of data condensation, data display, and conclusion drawing and verification (Rony Zulfirman, 2022). The data obtained were first selected and grouped according to themes relevant to the research focus, then presented in narrative form to facilitate the interpretation process (Janati et al., 2025). Data validity was maintained through source triangulation, method triangulation, and member checking, so that the research results possess a high level of credibility and are able to provide a comprehensive depiction of digital transformation within the halal industry ecosystem among halal MSMEs in Pekanbaru City.

RESULTS

The selection of six cases in this study aims to obtain in-depth information and capture the diversity of digital transformation practices among the msme under study, rather than to achieve statistical representativeness of all halal msme in pekanbaru city. The cases vary based on business characteristics and patterns of digital technology adoption—particularly regarding marketing, transactions, consumer communication, business management, and the dissemination of information on halal products. Consequently, these six cases serve to identify similarities and differences in the digital transformation practices of the msme examined. The study's findings are understood within the context of these six cases and are not intended to be statistically generalized to the entire population of halal msme in pekanbaru city. The informant profile data for this study are as follows:

Table 1. Informant Profiles and Digital Technology Utilization

No	MSMES	Business Subsector	Digital Technology Used	Main Digital Activities
1	Hojicha	Beverages	Social media, instant messaging apps, digital payments	Product Promotion, Consumer Communication, Order Acceptance, And Digital Transactions
2	Jajanan Aa Eka	Food, snacks	Social media	Product Promotion, Consumer Communication, Order Acceptance, And Digital Transactions
3	Jellins Cookies	Processed foods/cakes and cookies	Social media, digital payments	Product Promotion, Consumer Communication, Order Acceptance, And Digital Transactions
4	Manggleng Mbak Esti	Snacks/processed food products	Social media	Product Promotion, Consumer Communication, Order Acceptance, And Digital Transactions
5	Maswook Coffee	Beverages/coffee shops	Social media, instant messaging apps, digital payments	Product Promotion, Consumer Communication, Order Acceptance, And Digital Transactions
6	Sambal Pecel Khamu	Food products/processed foods	Social media, marketplaces, digital payments	Product Promotion, Consumer Communication, Order Acceptance, And Digital Transactions

Source: Processed Data from Observation And Interview Results, 2026

Implementation of Digital Transformation Among Halal MSMEs in Pekanbaru City

The results show that halal MSME actors in Pekanbaru City utilize digital technology in various business activities, particularly for marketing, communication with consumers, payment transactions, and business management. The forms of technology utilization identified include the use of social media as a promotional tool, e-commerce platforms to expand markets, digital payments, and simple applications for financial record-keeping. The level of digital technology utilization differs across MSMEs, influenced by the readiness of human resources, business experience, and the characteristics of the products marketed. Based on the results of interviews, observation, and documentation, the forms of digital transformation implementation identified can be summarized as follows:

Table 2. Summary of Findings on Digital Transformation Implementation Among Halal MSMEs

Aspect	Interview Results	Meaning of Findings
Digital Marketing	Utilizing Instagram, TikTok, and marketplaces so that sales no longer come solely from local customers.	Digitalization expands market reach.
Digital Payment	Using QRIS and digital wallets to facilitate transactions.	Improves transaction efficiency and financial record-keeping.
Change in Consumer Behavior	Consumers more frequently search for product information via social media before purchasing.	Digitalization has become a market demand.
Digital Obstacles	Difficulty creating promotional content and managing digital advertisements.	Digital literacy remains low.
Human Resource Limitations	Do not yet have dedicated staff to manage digital marketing.	Human resources remain an obstacle to digital transformation.
Halal Product Information	Halal certificates are displayed on social media and marketplaces.	Increases consumer trust.
Digital Communication	Consumers more easily obtain information via WhatsApp and social media.	Business communication becomes more effective.
Government Support	Participating in digital marketing and marketplace usage training.	Training accelerates technology adoption.
Trustworthiness	UMKM actors maintain honesty in product information, halal product quality, and digital transaction management.	Increasing consumer trust through responsible business management.
Hisbah	UMKM actors ensure that the products marketed comply with halal regulations, have reasonable prices, and provide non-misleading information.	Encouraging oversight and compliance with Sharia principles in digital business activities.
Maslahah	Digitalisation is utilised to simplify services, expand market access, and improve the welfare of both entrepreneurs and consumers.	Digital transformation provides broader benefits to society without neglecting the principles of Sharia.

Source: Processed Data from Observation and Interview Results, 2026

Based on the table above, the research results show that digital transformation has been implemented by halal MSMEs in Pekanbaru City in various business aspects, including digital marketing, digital payments, communication with consumers, and the dissemination of halal product information. The use of Instagram, TikTok, marketplaces, QRIS, digital wallets, and WhatsApp helps business operators expand their market reach, increase transaction efficiency, and strengthen communication with consumers.

Changes in consumer behaviour, who more frequently seek product information through social media before making a purchase, encourage SMEs to become more active in utilising digital technology. However, the implementation of digital transformation still faces challenges, particularly the low digital literacy in creating promotional content and managing advertisements, as well as the limited human resources handling digital marketing.

The research results also show that MSME actors are starting to display halal certificates on social media and marketplaces as a form of transparency to increase consumer trust. In addition, government

support through digital marketing training and the use of marketplaces also helps business actors improve their ability to adopt digital technology.

Digital transformation in halal MSMEs is also implemented while adhering to Islamic economic values, namely amanah through honesty in product information and transactions, hisbah through compliance with halal principles and accurate information delivery, and maslahah through the use of technology to improve services, expand market access, and provide benefits for both entrepreneurs and consumers.

Supporting and Inhibiting Factors of Digital Transformation

The research findings indicate that digital transformation is supported by increased internet use, changes in consumer behavior toward digital transactions, and the availability of training and mentoring for MSMEs. In addition, ease of access to social media, marketplaces, and digital payment systems encourages business actors to develop technology-based business models.

On the other hand, the study also identified several obstacles, such as limited digital literacy, uneven human resource capabilities, limited capital for technology investment, and suboptimal continuous mentoring. These differences in capacity result in varying levels of digital transformation among MSMEs.

Contribution of Digital Transformation to the Halal Industry Ecosystem

Digital transformation contributes to strengthening the halal industry ecosystem through improved market access, business process efficiency, and transparency of halal product information. The use of digital platforms enables business actors to more easily convey information regarding products, production processes, and halal certification to consumers. In addition, faster communication through digital media strengthens the relationship between business actors and customers, thereby increasing trust in halal products.

The research findings indicate that digital transformation is not only utilized as a promotional medium but has become part of a business management strategy. The use of social media, marketplaces, and digital payments shows that halal MSMEs are beginning to adapt to changes in consumer behavior that increasingly rely on technology in the transaction process. This condition indicates that digital transformation contributes to improved operational efficiency and expanded market access, which ultimately supports the increased competitiveness of halal MSMEs.

DISCUSSION

Compared to previous studies, the findings from Pekanbaru City reveal a pattern similar to the digitalization trends of halal MSMEs in other regions of Indonesia and in countries with Muslim-majority populations. Research in Medan indicates that the use of digital technology can boost the competitiveness of halal MSMEs (Khairiah et al., 2025), while studies in Yogyakarta show that digital marketing, payments, financing, and platform usage play a role in supporting their performance (Ali Ashar Hotama, 2025). Internationally, research in Malaysia also demonstrates that technology adoption among halal MSMEs is influenced by technological readiness, human resource capabilities, and the need to expand markets and enhance competitiveness (Bayu ari fianto, faradillah putri fauzi, noven suprayogi, dian filianti, cristopher gan, 2026)

These findings reinforce research results from Pekanbaru, confirming that digital transformation is a crucial element in the development of halal MSMEs, although the extent of technology adoption remains influenced by the specific conditions and characteristics of each region.

From a theoretical perspective, these findings can be explained through the Technology-Organization-Environment (TOE) Framework, which emphasizes that the success of technology adoption is influenced by technological readiness, organizational capacity, and external environmental support. In this study, the readiness of business actors to utilize digital technology is an important internal factor, while changes in consumer behavior, the development of digital infrastructure, and government support are external factors that accelerate the digital transformation process.

This study also shows that digital transformation still faces various obstacles, particularly low digital literacy, limited human resources, and minimal technology investment. These findings indicate that

digital transformation requires not only the availability of technology but also improved business actor competency through training, mentoring, and digital capacity building. Thus, the development of halal MSMEs requires synergy among the government, higher education institutions, mentoring bodies, and business actors so that the digitalization process can take place sustainably.

Within the context of sharia economics, digital transformation contributes to strengthening the halal industry ecosystem through increased transparency of product information, expanded access to the halal market, and strengthened consumer trust. Digitalization enables business actors to convey information regarding product halal status more openly, thereby supporting the implementation of sharia values such as amanah (trustworthiness), 'adl (justice), and maslahah (public benefit). Therefore, digital transformation is not only an instrument for improving business performance but also serves as a strategy for building a more inclusive, integrated, and sustainable halal industry ecosystem.

Implementation of Islamic Economic Values on Amanah, Hisbah, and Mashlahah

The implementation of digital transformation in halal MSMEs in Pekanbaru City shows that the use of technology remains grounded in Islamic economic values, particularly amanah, hisbah, and maslahah. The value of amanah is reflected in the commitment of business actors to convey product information honestly, include halal certificates on digital media, and maintain product quality and transactions responsibly. Meanwhile, the value of hisbah is realised through oversight of business activities by ensuring that marketed products comply with halal regulations, prices are set fairly, and the information provided to consumers does not contain elements of deception or manipulation. The application of these two values strengthens consumer trust in halal products marketed through digital platforms.

In addition, digital transformation also reflects the implementation of the maslahah value, which brings broader benefits to both business actors and society. The use of social media, marketplaces, and digital payment systems not only increases operational efficiency and expands market access but also makes it easier for consumers to obtain information about halal products quickly and transparently. Thus, the digitalisation of halal MSMEs is not solely orientated towards increasing economic profits, but also supports the creation of business activities that provide benefits, uphold Sharia principles, and contribute to strengthening a sustainable halal industry ecosystem.

CONCLUSION

This research shows that digital transformation has been implemented by halal SMEs in the city of Pekanbaru through the utilisation of social media, marketplaces, digital payment systems, and communication applications to support marketing, transaction, and customer service activities. The implementation has provided benefits such as market reach expansion, increased operational efficiency, ease of transactions, and transparency of halal product information. However, the level of digital transformation adoption still varies among SMEs due to factors such as the readiness of business actors, changes in consumer behaviour, training support, and various obstacles like low digital literacy, limited human resources, and the suboptimal use of digital technology in business management.

The findings of this research emphasise that digital transformation plays a strategic role in strengthening the halal industry ecosystem through increased market access, enhanced business communication, process efficiency, and increased consumer trust in halal products. Therefore, digital transformation not only serves as a means of adapting to technological advancements but also becomes an important part of developing more competitive and sustainable halal SMEs. The results of this research are expected to serve as a reference for the development of policies and strategies for the digitalisation of halal MSMEs, while also enriching the study of digital transformation from the perspective of Islamic economics. This research recommends that the government and related institutions enhance training and support for the digital transformation of halal SMEs sustainably, so that the utilisation of technology can run optimally and remain aligned with Islamic economic values in supporting the strengthening of the halal industry ecosystem.

In line with these findings, the government, Sharia financial institutions, MSME associations, and training providers need to strengthen the digital transformation ecosystem for halal MSMEs through shared digital marketing services, needs-based digital competency training, and affordable Sharia micro-financing to support technology investment; this will help address limitations in human resources, low

digital literacy, and capital constraints, while fostering a more inclusive and sustainable digital transformation for halal MSMEs in Pekanbaru City.

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AUTHOR CONTRIBUTION STATEMENT

Conceptualization, research design, methodology development, and the formulation of the qualitative case study framework based on the Technology-Organization-Environment (TOE) Framework were carried out by Delima Afriyanti, Surya Tegar Widijantoro, Landes Yuanda, and Nurlaili Janati. Data collection, including in-depth interviews, observation, and documentation involving six halal MSMEs in Pekanbaru City, was conducted by Delima Afriyanti and Surya Tegar Widijantoro. Formal analysis, including data condensation, data display, conclusion drawing, and verification following the interactive model of Miles, Huberman, and Saldaña, as well as data validity testing through source triangulation, method triangulation, and member checking, was performed by Delima Afriyanti, Surya Tegar Widijantoro, and Landes Yuanda. Original draft preparation and writing were conducted by Delima Afriyanti and Nurlaili Janati, while review, editing, and revision were performed by Surya Tegar Widijantoro and Landes Yuanda. All authors have read and approved the final version of the manuscript and agree to be accountable for all aspects of this work.

AI DISCLOSURE STATEMENT

During the preparation of this work, the author(s) used AI-assisted tools, such as grammar checkers and language enhancement software, solely for the purpose of improving readability and refining the language of the manuscript. No generative AI tools were used for qualitative data analysis, interpretation of results, conceptual framework development, Islamic economic interpretation, or core scientific writing. The authors take full responsibility for the originality, accuracy, and integrity of the research findings and the final content of this article.

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CONFLICTS OF INTEREST

The authors declare that there are no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. The research was conducted independently, and the results are presented objectively and without bias. The authors have no affiliation with or financial interest in any halal MSME, halal certification body, or digital platform mentioned in this study that could be perceived as influencing the analysis or conclusions of this research.

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