

BEYOND HALAL CERTIFICATION: INTERNAL AND EXTERNAL HALAL SUPPLY CHAIN READINESS FOR SUSTAINABLE FOOD SMES

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Abstract

Indonesia's Free Halal Certification Program/Program Sertifikasi Halal Gratis (SEHATI) has significantly accelerated halal certification among food and beverage small and medium enterprises (SMEs). However, limited attention has been given to whether certification is accompanied by adequate halal supply chain readiness to sustain business performance. This study examines the internal and external halal supply chain readiness of halal-certified food and beverage SMEs following participation in the SEHATI Program. A qualitative multiple-case study was conducted involving three halal-certified SMEs in Yogyakarta. Data were collected through in-depth interviews, observation, and document analysis, and were analyzed using cross-case analysis. The findings indicate that halal certification enhances internal halal supply chain readiness by strengthening compliance with halal production requirements, including raw material selection, production processes, and the Halal Product Assurance System. However, these improvements do not automatically ensure a sustainable halal supply chain because upstream integration remains constrained by the limited availability of halal-certified raw materials. Halal certification also improves external halal supply chain readiness by increasing product visibility through digital marketing channels and strengthening consumer trust. Nevertheless, the absence of integrated digital halal governance, particularly halal verification and traceability mechanisms on digital platforms, limits the effectiveness of these benefits. These findings demonstrate that the sustainability of halal SMEs depends not only on certification itself but also on the integration of internal operational readiness and external ecosystem readiness. This study extends the Halal Supply Chain Management literature by introducing an integrated internal - external halal supply chain readiness framework and offers policy recommendations to strengthen Indonesia's post-certification halal ecosystem.

Keywords: Halal supply chain, halal certification, internal-external readiness, sustainable SMEs, SEHATI program

Introduction

Program sertifikasi halal gratis (SEHATI), launched by the Indonesian government in 2022, represents one of the country's strategic policy initiatives to accelerate the development of the national halal industry, particularly among micro, small, and medium enterprises (MSMEs) operating in the food and beverage sector. Through this program, the government seeks to reduce the financial barriers associated with halal certification while expanding MSMEs' access to the rapidly growing halal market at both the domestic and international levels. This policy has significantly increased the number of halal-certified products. According to data from the Halal Product Assurance Organizing Agency (BPJPH), more than 3.49 million halal certificates had been issued by the end of 2023, supported by 234 Halal Product Process Assistance Institutions (LP3H) and more than 77,000 Halal Product Process Assistants (PPH) across Indonesia. These achievements reflect the government's strong commitment to strengthening the national halal ecosystem through collaboration among multiple stakeholders, including BPJPH, LP3H, universities, community organizations, and MSMEs as the primary beneficiaries of the SEHATI Program (BPJPH, 2023; Ilham, 2022; Salam & Makhtum, 2022)

Despite this remarkable achievement, the substantial increase in halal certification does not automatically indicate the successful development of a sustainable halal industry. To date, the success of the SEHATI Program has largely been measured by the number of halal certificates issued, whereas post-certification halal supply chain readiness has received relatively limited attention. In practice, halal certification serves primarily as a regulatory compliance mechanism, while long-term business sustainability depends on the ability of business actors to maintain halal integrity throughout the entire supply chain, from raw material procurement and production processes to distribution and final consumption. In other words, the effectiveness of halal certification should not be assessed solely based on compliance with certification requirements, but also on the readiness of the halal supply chain to support sustainable business operations. This issue is particularly relevant for MSMEs, which often face constraints related to financial resources, access to halal-certified suppliers, technological capabilities, and distribution networks. Unlike large enterprises that generally possess well-established supply chain management systems, most MSMEs continue to rely heavily on local suppliers, unstable raw material availability, and limited marketing channels. Consequently, adapting to halal

certification requirements frequently creates operational challenges. Although halal certification enhances compliance with halal production standards, it may simultaneously introduce new challenges when the supporting halal supply chain ecosystem remains underdeveloped.

This phenomenon is consistent with the findings of a previous study on the implementation of the SEHATI Program in the Special Region of Yogyakarta (Yuliani, 2023). The study revealed that one of the most significant post-certification challenges lies in the ability of MSMEs to maintain business sustainability while enhancing product competitiveness. The most frequently reported issue concerns the limited availability of halal-certified raw materials within the upstream supply chain. As a result, many MSMEs are required to replace their primary raw materials with certified halal alternatives. Although such adjustments are necessary to ensure compliance with halal regulations, changes in raw materials may alter key product characteristics, including taste, texture, and quality consistency, which often constitute the core competitive advantages of MSMEs. Consequently, compliance with halal standards does not always translate into improved business sustainability and may even reduce product competitiveness if changes in raw materials are not accompanied by a well-developed halal supplier ecosystem. These findings suggest that post-certification challenges extend beyond regulatory compliance and highlight the importance of strengthening the broader halal supply chain ecosystem to ensure the long-term sustainability of halal-certified MSMEs.

This phenomenon indicates that the challenges surrounding the implementation of the SEHATI Program can no longer be understood solely as issues of halal certification; rather, they have shifted toward the broader issue of halal supply chain readiness. This shift in perspective is important because halal certification should be viewed as the starting point for developing a sustainable halal supply chain rather than the ultimate objective of the policy. In this context, the concept of Halal Supply Chain Management (HSCM) provides a relevant theoretical foundation for explaining how halal integrity is maintained throughout the entire value chain. (Tieman et al., 2012) define HSCM as an integrated system that ensures halal principles are consistently maintained throughout every stage of the supply chain, from raw material procurement (suppliers), manufacturing processes, and distribution to retail activities and final consumption. This perspective emphasizes that halal certification is not merely associated with production processes within individual firms but also depends on the interconnectedness of all actors involved in the halal supply chain.

Based on the framework in Figure 1, the effectiveness of HSCM is determined not only by firms' internal compliance with halal standards but also by the readiness of the external environment to support the delivery of halal value throughout the supply chain. Therefore, the success of halal certification should be understood through two complementary and interrelated dimensions. The first dimension is internal halal supply chain readiness, which refers to the operational readiness of MSMEs to implement halal principles through appropriate raw material procurement, standardized production processes, the implementation of the Halal Product Assurance System (SJPH), and effective internal process control. The second dimension is external halal supply chain readiness, which refers to the preparedness of the external ecosystem to support the sustainability of the halal supply chain through distribution networks, digital marketing, halal information transparency, and consumers' accessibility to halal products. These two dimensions constitute essential prerequisites for ensuring that halal certification generates sustainable benefits for the long-term development of halal food and beverage MSMEs in Indonesia.

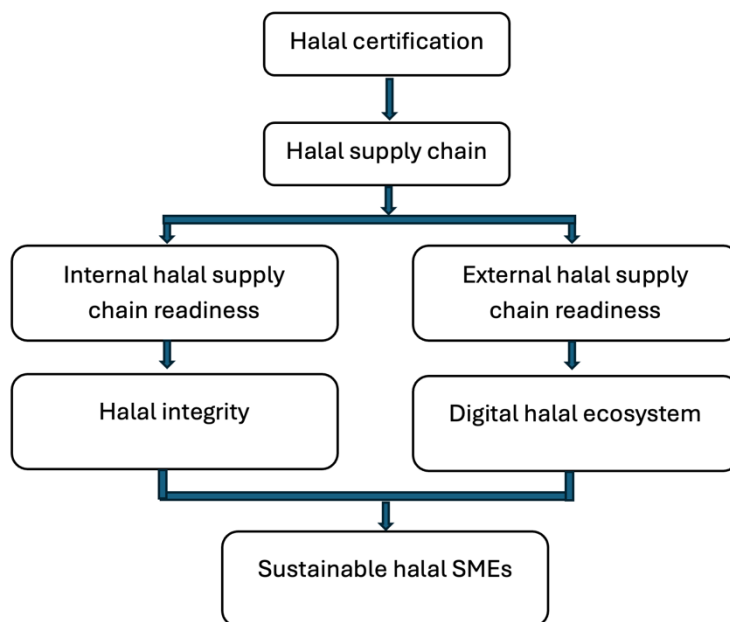


Figure1. Research Framework

The implementation of Halal Supply Chain Management (HSCM) has attracted considerable scholarly attention over the past decade. Most studies agree that HSCM plays a fundamental role in maintaining halal product integrity

while enhancing the competitiveness of the halal industry in global markets. (Omar & Jaafar, 2011) argue that HSCM functions not only as a mechanism for controlling production processes but also as an integrated system that ensures the consistency of halal status throughout the supply chain. This perspective was further developed by (Hashim & Shariff, 2016), who demonstrated that the primary challenges in HSCM implementation stem not only from operational complexity but also from weak coordination among supply chain actors. Consequently, the effectiveness of HSCM largely depends on the ability of all stakeholders to establish an integrated supply chain system, beginning with raw material suppliers and extending to end consumers.

The literature has further demonstrated that Halal Supply Chain Management (HSCM) is closely associated with the sustainability of the halal industry. (Khan et al., 2022) argued that a sustainable halal supply chain should not only ensure compliance with Sharia principles but also maintain operational efficiency, supply continuity, food safety, and long-term business sustainability. A similar perspective was proposed by (Rezai et al., 2015), who emphasized that sustainability in the halal supply chain should be understood comprehensively, encompassing the entire value chain from raw material procurement to final consumption. Accordingly, sustainability should no longer be viewed merely as an end result but rather as a consequence of the ability of all supply chain actors to consistently maintain halal integrity throughout the supply chain. In line with this conceptual development, scholarly attention has increasingly shifted toward the concept of halal food integrity. (Arshad et al., 2018) and (Mohamed et al., 2020, 2021) explained that halal integrity extends beyond compliance with halal certification standards. It also encompasses the ability of the supply chain system to ensure product traceability, information transparency, food safety, and the prevention of cross-contamination throughout the distribution process. Within this perspective, halal certification serves as an important control mechanism but is not the sole determinant of halal product integrity. Rather, the capability of every actor within the supply chain to consistently maintain halal standards after certification is equally essential.

Beyond operational aspects, recent studies have increasingly emphasized the importance of technological innovation in supporting HSCM implementation. For example, (Vikaliana et al., 2021) demonstrated that the adoption of digital technologies and blockchain can enhance the visibility, transparency, and traceability of halal products. Similarly, (Fikri & Rini, 2023) found that effective HSCM implementation improves firms' operational performance, while (Putri &

Lusiantoro, 2022) highlighted its contribution to strengthening risk management and business resilience. Collectively, these studies indicate that HSCM has evolved from a halal control mechanism into a strategic instrument for enhancing competitiveness and business sustainability. Despite these advances, the existing HSCM literature has predominantly focused on halal logistics (Syamsurizal et al., 2026) (Abd Rahman et al., 2023; Haleem & Khan, 2017; Karia, 2022; Khan et al., 2022; Noorliza, 2021), halal integrity (Ali et al., 2022; Handayani et al., 2022; Mohamed et al., 2021; Soon et al., 2017; Susiang et al., 2026; Yunan et al., 2020; Yusaini et al., 2016), operational performance (Azmi et al., 2018; Kurniawati & Cakravastia, 2023; Maulana et al., 2026; Muhamed et al., 2023; Syamsurizal et al., 2026; Zainuddin et al., 2019, 2020), and technology adoption in large firms or manufacturing industries (Hendayani & Fernando, 2023; Zainuddin et al., 2020).

Several limitations remain evident in the existing HSCM literature. First, existing HSCM studies primarily conceptualize halal supply chain management as a mechanism for maintaining halal compliance, integrity, logistics performance, or operational efficiency (Hashim & Shariff, 2016; Khan et al., 2022; Mohamed et al., 2020; Omar & Jaafar, 2011). While these studies establish the importance of maintaining halal integrity across supply chain activities, they provide limited explanation of how organizational capabilities within firms interact with external ecosystem conditions after halal certification. Second, studies on supply chain integration emphasize coordination, information sharing, and relationships among supply chain actors, but generally do not specifically address the post-certification readiness required to maintain halal integrity and business sustainability. Similarly, the organizational capability perspective emphasizes firms' internal resources and capabilities, whereas ecosystem-oriented perspectives highlight the role of external actors, infrastructure, institutions, and market environments. These perspectives are relevant to understanding HSCM implementation, but they have rarely been integrated into a single analytical framework that explains post-certification halal supply chain readiness among MSMEs.

This distinction is particularly important in the context of MSMEs. Unlike large firms that generally possess more established organizational capabilities, supplier networks, technological infrastructure, and distribution systems, MSMEs often operate with limited resources and remain highly dependent on external suppliers and local market networks. Consequently, halal certification may strengthen internal compliance without necessarily ensuring the availability of certified raw materials and effective distribution channels. The existing literature

therefore provides important insights into individual HSCM components, but offers limited empirical explanation of how these internal and external conditions jointly shape the post-certification sustainability of halal MSMEs. This study addresses this gap by examining halal supply chain readiness as an analytical perspective rather than proposing internal – external readiness as an new theoretical construct.

In this study, internal halal supply chain readiness is defined as the operational readiness of MSMEs to maintain halal integrity through the availability of halal-certified raw materials, compliance with halal production procedures, the implementation of the Halal Product Assurance System (SJPH), and effective internal process control. Meanwhile, external halal supply chain readiness refers to the readiness of the external ecosystem to support halal supply chain sustainability through digital distribution, halal product visibility, information transparency, and digital platform governance that enables consumers to access reliable halal information efficiently. Building on the HSCM perspective proposed by (Tieman et al., 2012), this study uses internal and external halal supply chain readiness as an analytical lens to examine how halal-certified of MSMEs maintain halal integrity and pursue supply chain sustainability after certification.

By employing a multiple-case study approach involving three halal-certified food and beverage MSMEs in the Special Region of Yogyakarta, this study addresses two research questions. *First*, how does internal halal supply chain readiness developed among food and beverage MSMEs after obtaining halal certification through the SEHATI Program? *Second*, how does external halal supply chain readiness support or constrain the sustainability of halal-certified MSMEs after the SEHATI Program? Theoretically this study will provide in-depth overview of the operational challenges faced by MSMEs after halal certification and develops an analysis of the internal and external readiness of the halal supply chain to spur a sustainable halal supply chain. Methodologically, the multiple-case study design provides contextual insights into how these readiness dimensions emerge and interact in real-world MSME settings.

Methodology

This study employed a qualitative approach using a multiple case study design to gain an in-depth understanding of how internal halal supply chain readiness and external halal supply chain readiness are developed among food and beverage MSMEs after obtaining halal certification through the Free Halal Certification Program (SEHATI). A multiple case study approach was selected

because it enables researchers to comprehensively explore the dynamics of Halal Supply Chain Management (HSCM) implementation in real-world settings while capturing the interrelationships between internal operational processes and external environmental factors that influence business sustainability. Furthermore, the use of multiple case studies facilitates cross-case analysis, allowing the identification of both common patterns and unique characteristics across different MSMEs.

The study was conducted in the Special Region of Yogyakarta, particularly in Sleman Regency and Yogyakarta City. These two locations were selected because they represent the largest concentration of food and beverage MSMEs in the province. The number of MSME in Sleman City reached 111,043. This is the highest number compared to other regencies, while Yogyakarta City has 32,000 MSMEs, partially due to its limited geographical area. In addition, they also have experienced intensive implementation of the SEHATI Program through the assistance provided by the Halal Product Process Assistance Institution (LP3H) of UIN Sunan Kalijaga Yogyakarta. Total of the research focused on three halal-certified food and beverage MSMEs that had obtained certification through the SEHATI Program. The cases were purposively selected because they represent different patterns of halal supply chain readiness following SEHATI certification. Mimilapar represents an MSME that experienced substantial operational adjustments due to supplier changes after certification, whereas N'dah Patisserie & Pizza and Bakpia Istu represent MSMEs that had already implemented halal-oriented production practices prior to certification. These contrasting characteristics enable theoretical replication and meaningful cross-case comparison, thereby providing a deeper understanding of both internal and external halal supply chain readiness across different operational contexts (Yin, 2018). Besides the three key informants, this study also involved LP3H UIN Sunan Kalijaga and P3H to cross-check the information, thereby further confirming the validity of the data provided by the key informants. The characteristics of the informants are presented in Table 1.

Table 1. Informant Characteristics

Informant	Position	Years of Business	Product	Role
P1	Owner Mimilapar	8 years	Fish cake	Main informant
P2	Owner N'dah	10 years	Bakery	Main informant

P3	Owner Bakpia Istu	12 years	Traditional Bakery	Main informant
P4	Halal Process Assistant (P3H)	>30 SMEs assisted	-	Supporting informant
P5	LP3H	Institutional representative	-	Supporting informant

Primary data were collected through semi-structured interviews, observation, and document analysis (Creswell & Poth, 2018). Semi-structured interviews were employed to obtain systematic information while providing participants with sufficient flexibility to elaborate on their experiences and the challenges encountered during the implementation of Halal Supply Chain Management (HSCM) following halal certification (Kvale & Brinkmann, 2015). Each interview lasted approximately 120–180 minutes and was conducted at the participants' business premises. With the participants' consent, all interviews were audio-recorded and subsequently transcribed verbatim. The interview protocol was developed based on the two principal dimensions of this study: internal halal supply chain readiness and external halal supply chain readiness. The internal dimension covered raw material procurement, production processes, the Halal Product Assurance System (SJPH), and operational control mechanisms. Meanwhile, the external dimension encompassed product distribution, digital marketing, halal product visibility, halal information transparency, and the role of the digital ecosystem in supporting business sustainability. Throughout the fieldwork, the researchers also conducted participant observations to obtain a contextual understanding of HSCM implementation within the participating MSMEs. In addition, documentary evidence, including halal certificates, operational procedures, production records, and digital marketing materials, was collected to complement and validate the interview findings.

Data analysis followed an iterative process guided by the interactive model of (Miles et al., 2014), which comprises data condensation, data display, and conclusion drawing and verification. This model served as the overarching analytical framework, while thematic coding was employed as the specific procedure for identifying and developing patterns within the empirical data. All interview recordings were transcribed to analysis. During data condensation, the transcripts, observation notes, and documentary materials were systematically reviewed and coded according to the research focus. Initial coding was conducted to identify meaningful segments related to halal supply chain practices, which were subsequently grouped into categories reflecting internal and external halal supply chain readiness. These categories were continuously compared and refined throughout the analysis to identify recurring patterns and variations across the cases.

Data collection and analysis were conducted concurrently, allowing emerging findings to inform subsequent data collection. Data collection was concluded when additional interviews and observations no longer generated substantially new information relevant to the analytical categories, indicating sufficient data saturation (Jeaheng et al., 2020). Following within-case analysis, a cross-case analysis was conducted to systematically compare the three MSMEs and identify similarities, differences, and context-specific patterns in HSCM implementation after halal certification (Yin, 2018). The final stage involved integrating the cross-case findings to develop an analytical explanation of how halal certification shapes internal and external halal supply chain readiness and how these dimensions relate to business sustainability.

To ensure the trustworthiness of the findings, several strategies were employed. Data triangulation was achieved by comparing evidence obtained from semi-structured interviews, participant observations, and documentary sources, including halal certificates, production records, and digital marketing materials. Member checking was conducted by sharing preliminary interpretations with key informants to verify the accuracy and credibility of the findings. In addition, regular discussions among the research team throughout the coding and interpretation process helped minimize researcher bias and enhance analytical consistency. An audit trail documenting coding decisions, category development, and analytical memos was also maintained to ensure transparency throughout the research process. Collectively, these procedures strengthened the credibility, dependability, confirmability, and transferability of the findings.

Result and Discussion

Before analyzing internal halal supply chain readiness and external halal supply chain readiness, this study first maps the implementation of Halal Supply Chain Management (HSCM) across three halal-certified food and beverage MSMEs in the Special Region of Yogyakarta, namely Mimilapar, N'dah Patisserie & Pizza, and Bakpia Istu (Table 2). These three MSMEs were selected because they had obtained halal certification through the SEHATI Program, while representing different business characteristics, operational experiences, and levels of readiness in implementing HSCM principles. Comparing the conditions before and after halal certification reveals that the certification process not only introduced administrative compliance but also stimulated operational changes throughout the halal supply chain, ranging from raw material procurement and production processes to product distribution and consumer interaction.

The findings indicate that the implementation of HSCM had already begun in all three MSMEs prior to obtaining halal certification. However, the level of implementation remained largely informal and was primarily shaped by the

owners' religious values, accumulated business experience, and long-established production practices. This pattern was particularly evident in N'dah Patisserie & Pizza and Bakpia Istu. Both enterprises had consistently used ingredients that were considered halal, implemented hygienic production procedures, and separated production equipment from household utensils, despite not yet being formally required to do so through halal certification. These practices demonstrate that halal principles had already become embedded in the operational culture of both businesses. Consequently, halal certification functioned primarily as a mechanism for formalizing and strengthening existing practices rather than introducing fundamental changes to their production systems.

Table 2. Implementation of halal supply chain management (HSCM)

HSCM Components	HSCM before halal certified	HSCM after halal certified	Main Findings
Preparation	Some SMEs used safe raw materials, but not all were halal-certified.	All SMEs strengthened raw material selection and gradually shifted to halal-certified suppliers and ingredients.	The most significant changes occurred in supplier selection and raw material sourcing.
Production process	Production practices were generally hygienic, but halal standard operating procedures (SOPs) were not systematically documented.	Halal SOPs became more standardized, and production equipment was more strictly separated from household utensils, particularly among non-	Halal certification strengthened operational discipline and process standardization.

		Muslim-owned SMEs.	
Distribution	Products were marketed through offline and online channels without a clear halal identity.	Halal labels were consistently displayed on product packaging and digital marketing platforms.	Halal certification enhanced product visibility and market credibility.
Consumption	Consumer trust primarily depended on the business owner's reputation.	Halal certification increased consumer trust, particularly among first-time customers.	Positive consumer perceptions of halal products improved after certification.

In contrast, Mimilapar experienced more substantial operational adjustments following halal certification. Prior to certification, the enterprise relied on several key ingredients, including flour and palm sugar, that had not yet been halal-certified because they were perceived to produce superior product quality in terms of taste and texture. This situation did not reflect a lack of commitment to halal principles; rather, it resulted from the limited availability of halal-certified raw materials within the upstream supply chain. After obtaining halal certification, the business replaced these ingredients with certified halal alternatives to comply with certification requirements. However, this transition affected the sensory characteristics of the product, particularly the flavour and texture of the vinegar-based sauce that constitutes the distinctive identity of Mimilapar's *empek-empek*. These findings suggest that adaptation to halal standards does not always occur without operational trade-offs, particularly when the upstream halal supply ecosystem remains underdeveloped and the availability of halal-certified inputs is still limited.

Internal Halal Supply Chain Readiness after SEHATI Certification

One of the principal findings of this study is that the SEHATI Program has enhanced internal halal supply chain readiness among the three MSMEs investigated, although the level and characteristics of readiness varied across cases. In this study, internal halal supply chain readiness is defined as the operational capability of MSMEs to integrate halal principles into all internal business activities, including raw material procurement, production process control, the implementation of the Halal Product Assurance System (SJPH), and the continuous management of product quality (Tieman et al., 2012). From this perspective, halal certification should not be regarded as the ultimate objective of Halal Supply Chain Management (HSCM), but rather as a mechanism that strengthens the internal capabilities of firms to maintain halal integrity consistently throughout their operations (Mohamed et al., 2021).

Based on the findings from the three case studies, Mimilapar, N'dah Patisserie & Pizza, and Bakpia Istu, this study found that halal certification significantly improved MSMEs' compliance with halal production requirements. Nevertheless, increased compliance did not automatically lead to the establishment of a sustainable halal supply chain. These findings suggest that the success of the SEHATI Program should not be assessed solely by the increasing number of halal certificates issued, but also by the extent to which halal certification strengthens the entire halal supply chain, encompassing raw material procurement, production processes, distribution, and ultimately product consumption by consumers (Khan et al., 2022; Tieman et al., 2012).

The cross-case analysis further revealed that all three MSMEs experienced positive improvements in their production systems following halal certification. These improvements were reflected in more rigorous raw material selection, the separation of production equipment from household utensils, enhanced hygiene standards, and more systematic production documentation in accordance with the requirements of the Halal Product Assurance System (SJPH). In the cases of N'dah Patisserie & Pizza and Bakpia Istu, however, these changes did not require substantial operational adjustments because halal-oriented production practices had already been embedded in their business operations long before the certification process. Both enterprises had consistently used raw materials with clear halal status, implemented hygienic production procedures, and maintained separate production and household equipment. Consequently, halal certification primarily served to formalize and institutionalize practices that had already been implemented rather than introducing fundamental operational changes (Omar & Jaafar, 2011).

On the other hand, a different pattern was observed in Mimilapar. After obtaining halal certification, the enterprise was required to replace several key raw materials with halal-certified alternatives. However, this transition resulted in noticeable changes to the product's characteristics, particularly the flavour and texture of the vinegar sauce that constitutes the distinctive identity of Mimilapar's *empek-empek*. These findings indicate that compliance with halal standards during the production stage does not necessarily guarantee the preservation of product quality that has been recognized and appreciated by consumers. In other words, although halal certification enhances both administrative and operational compliance, it does not automatically ensure business sustainability when the upstream halal supply ecosystem remains underdeveloped and the availability of halal-certified raw materials is still limited.

Consistent with previous studies, effective Halal Supply Chain Management (HSCM) has been shown to improve sustainability performance, customer satisfaction, and process quality (Haleem & Khan, 2017; Jannah & Wijayanti, 2025; Rajendran et al., 2024). Beyond enhancing product quality and marketing performance, prior research has also demonstrated that HSCM strengthens halal integrity, product safety, and consumer trust by ensuring that halal requirements are consistently maintained throughout the supply chain (Ali et al., 2022). The findings of the present study support these arguments, as all three MSMEs experienced improvements in internal operational control following halal certification. However, this study extends the existing literature by demonstrating that operational improvements alone are insufficient to achieve a sustainable halal supply chain when upstream suppliers are not adequately prepared to provide halal-certified inputs. This finding can be interpreted through the Resource-Based View (RBV) theory (Barney, 1991), which conceptualizes Halal Supply Chain Management as a strategic organizational capability. By integrating halal requirements into procurement, production, quality assurance, and operational control, firms develop valuable, rare, and difficult-to-imitate organizational capabilities that enhance operational efficiency, strengthen product quality, and sustain long-term competitive advantage. Nevertheless, the case of Mimilapar suggests that the value of these internal capabilities remains constrained when complementary resources within the external supply network are insufficiently developed.

When compared with previous studies, the findings of this research both confirm existing evidence and provide new theoretical insights. (Omar & Jaafar, 2011) argued that halal certification serves as a fundamental pillar of Halal Supply

Chain Management by promoting greater standardization of production processes. Similarly, (Mohamed et al., 2020) demonstrated that HSCM implementation enhances halal integrity within the food industry, while (Fikri & Rini, 2023) reported that effective HSCM contributes to improved operational performance. The findings of the present study corroborate these earlier studies, as all three MSMEs exhibited higher levels of compliance with halal production requirements following certification. However, this study also extends the existing literature by demonstrating that increased compliance does not necessarily translate into a sustainable halal supply chain if halal certification policies are not accompanied by the development of a supportive upstream halal ecosystem. Accordingly, the effectiveness of HSCM should be understood not merely as the outcome of firm-level compliance but as the result of coordinated readiness among all actors within the halal supply chain. This perspective broadens the current HSCM literature by emphasising the importance of ecosystem readiness, rather than focusing solely on organisational compliance, as a prerequisite for achieving long-term sustainability in halal supply chains.

Accordingly, the findings of this study propose an internal governance framework for halal supply chain readiness, as illustrated in Figure 2.

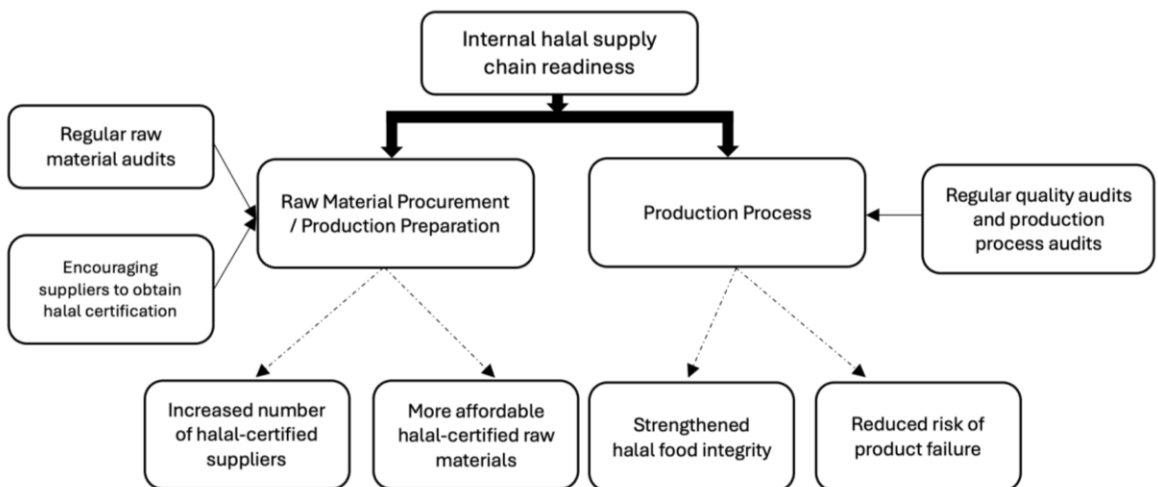


Figure 2. Implementation of Internal Halal Supply Chain Readiness

Information:

- > : Required policy
- - - - -> : Effect of implementation

The findings of this study generate several important policy implications. First, the government should shift the orientation of the SEHATI Program from merely increasing the number of halal-certified MSMEs toward developing an integrated halal ecosystem that spans the entire supply chain, from upstream suppliers to downstream markets. Halal certification should be gradually extended to raw material suppliers, thereby enabling MSMEs to access halal-certified raw materials without compromising product quality. Second, BPJPH, in collaboration with relevant government agencies, should establish an integrated information system for halal-certified raw material suppliers that is easily accessible to MSMEs. Such a system would improve the efficiency and transparency of sourcing halal-certified inputs while reducing information asymmetry between suppliers and business actors. Third, post-certification assistance programs should be strengthened beyond administrative compliance by providing continuous technical support for product reformulation, quality assurance, supplier development, and production technology adaptation whenever changes in raw materials are required. Through these initiatives, the implementation of Halal Supply Chain Management (HSCM) can move beyond administrative compliance to establish a genuinely sustainable halal supply chain that enhances the long-term competitiveness of halal food and beverage MSMEs in Indonesia.

External Halal Supply Chain Readiness after SEHATI Certification

The second dimension determining the Halal Supply Chain Management (HSCM) after SEHATI Program is external halal supply chain readiness. Unlike internal readiness, external readiness refers to the preparedness of the broader ecosystem that supports the sustainability of the halal supply chain. This ecosystem encompasses digital marketing infrastructure, platform governance, access to halal information, regulatory support, and the interactions between business actors and consumers. The findings indicate that halal certification has strengthened the market position of MSMEs by enhancing consumer trust; however, its effectiveness remains highly dependent on the readiness of the external ecosystem that connects producers with consumers.

The multiple-case analysis of Mimilapar, N'dah Patisserie & Pizza, and Bakpia Istu reveals that all three MSMEs have incorporated halal certification into their distribution and marketing communication strategies. After obtaining halal certification, each business began displaying the halal logo on product packaging, promoting through social media platforms, and positioning halal status as a

central element of its digital marketing communications. These findings suggest that halal certification is no longer perceived merely as a regulatory compliance instrument but has evolved into a reputational asset that strengthens business credibility in the marketplace. Information regarding halal certification serves as a quality signal that reduces consumer uncertainty during online purchasing decisions, particularly among first-time customers who have no prior experience with the product or the owner.

Nevertheless, the use of halal certification in digital distribution varied across three MSMEs. At Mimilapar, halal certification became a key instrument for building consumer trust, particularly because the owner's non-Muslim background had previously raised concerns about product halal status. Displaying the halal logo on product packaging and Instagram significantly reduced consumer skepticism and improved market acceptance. At N'dah Patisserie & Pizza, halal certification increased social media engagement while reducing consumer inquiries regarding product halal status. Meanwhile, Bakpia Istu primarily used halal certification to broaden its promotional reach beyond loyal customers, although most sales continued to rely on direct purchases at its physical outlet. These findings suggest that external halal supply chain readiness depends not only on halal certification itself but also on market characteristics, consumer behavior, and the distribution and marketing strategies adopted by MSMEs.

However, this study found that external halal supply chain readiness has not yet been fully developed because the digital ecosystem does not adequately support the dissemination of halal information. All informants reported that, at the time of the study, neither marketplaces nor social media platforms provided dedicated verification or classification mechanisms that enable consumers to search for products based on their halal certification status. Consequently, the visibility of halal information relies largely on the individual initiative of business owners to display halal logos or upload certification documents. This finding indicates that external readiness remains fragmented. While MSMEs are prepared to leverage halal certification as a marketing strategy, the digital infrastructure connecting MSMEs and consumers has yet to provide sufficient support. Therefore, the sustainability of HSCM depends not only on firms' internal readiness but also on an external ecosystem that ensures halal information is transparent, easily accessible, and verifiable by consumers.

These findings are consistent with previous studies demonstrating that knowledge management and market orientation positively influence the

performance of halal SMEs in Singapore (Mohd Yunus et al., 2026). Similarly, (Ahmed et al., 2025) reported that halal-oriented strategies enhance both market and financial performance by responding to market demand, government support, and emerging business opportunities. In addition, (Sharabati et al., 2024) found that digital marketing adoption significantly promotes business growth among MSMEs. Collectively, these studies suggest that digital infrastructure, technology adoption, and effective marketing strategies are essential components of external halal supply chain readiness, enabling halal MSMEs to strengthen product visibility and market competitiveness. These findings can also be interpreted through the Dynamic Capabilities Theory (Teece et al., 1997), which argues that sustainable competitive advantage depends not only on valuable strategic resources but also on an organization's ability to integrate, reconfigure, and leverage those resources in response to environmental change. In this study, halal certification represents a strategic resource that enhances product credibility; however, its economic value can only be fully realized when MSMEs possess dynamic capabilities, including digital technology adoption, digital marketing competence, and the ability to utilize digital platform infrastructure to increase product visibility.

Compared with previous studies, the findings both confirm and extend the HSCM literature on distribution. Omar & Jaafar (2011) identified distribution as the critical link connecting MSMEs and consumers, while (Vikaliana et al., 2021) emphasized the role of digital technologies and blockchain in enhancing the visibility and traceability of halal products. This study supports these perspectives by demonstrating that digital media increases the visibility of halal-certified products. However, it also extends the existing literature by showing that the effectiveness of digital distribution depends not only on the digital capabilities of MSMEs but also on the readiness of digital platform governance as part of the broader halal ecosystem. In other words, successful external halal supply chain readiness results from the interaction among business actors, regulators, and digital platform providers rather than from the capabilities of MSMEs alone.

Based on these findings, this study offers several policy implications. First, BPJPH should establish strategic partnerships with national e-commerce platforms to integrate the national halal certification database into product search systems, enabling consumers to identify halal-certified products more easily and reliably. Second, a standardized mechanism for presenting halal information on digital platforms should be developed through an automated verification system (e.g., a verified halal badge) directly linked to the national halal

certification database. Third, post-certification assistance programs should be expanded beyond administrative compliance to strengthen MSMEs' digital marketing capabilities, enabling them to maximize the economic value of halal certification. Finally, the government should recognize digital platform governance as component of the national halal ecosystem. Strengthening external halal supply chain readiness will enable halal certification to function not only as evidence of regulatory compliance but also as a strategic instrument for enhancing information transparency, halal traceability, market competitiveness, and the long-term sustainability of halal supply chains in the digital economy.

Accordingly, this study develops an external halal supply chain readiness framework to explain how external ecosystem readiness supports the sustainability of Halal Supply Chain Management (HSCM), as presented in Figure 3.

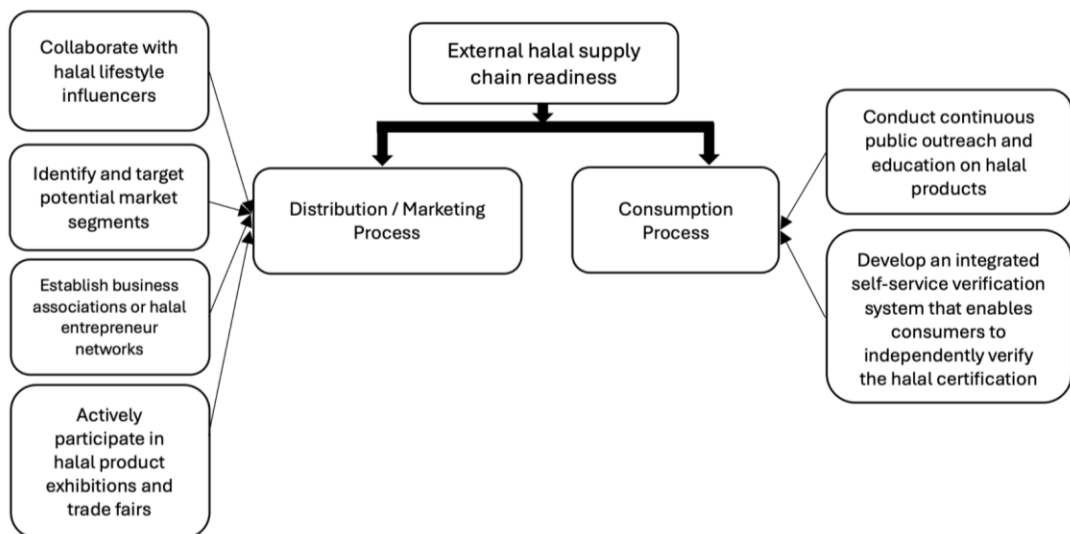


Figure 3. Implementation Of External Halal Supply Chain Readiness

Information:

Required policy: —————>

Conclusion

This study demonstrates that the sustainability of halal supply chain management (HSCM) after Indonesia's SEHATI Program is determined not solely by the acquisition of halal certification but by the readiness of both internal and external halal supply chain systems. Through a multiple-case study of three halal food SMEs in Yogyakarta, the halal certification significantly improves internal halal supply chain readiness by encouraging stricter raw material selection,

standardized production procedures, implementation of the Halal Product Assurance System (SJPH), and better operational quality control. However, internal compliance alone does not automatically ensure a sustainable halal supply chain when upstream suppliers and supporting ecosystems remain underdeveloped. Furthermore, halal certification enhances external halal supply chain readiness by increasing product visibility, consumer confidence, and digital marketing opportunities. Nevertheless, these benefits remain constrained by weak digital platform governance, limited halal product verification features, and the absence of an integrated halal digital ecosystem. These findings indicate that sustainable halal supply chains require simultaneous strengthening of both internal organizational capabilities and external institutional support.

This study theoretically extends the literature of Halal Supply Chain Management by introducing internal halal supply chain readiness and external halal supply chain readiness as complementary analytical dimensions for evaluating post-certification sustainability, thereby shifting the discussion from mere compliance with certification to supply chain readiness. The findings also reinforce the relevance of Dynamic Capabilities Theory by demonstrating that halal certification creates greater competitive value only when supported by digital capabilities, technological adoption, and effective marketing strategies. From a policy perspective, the findings suggest that the future direction of the SEHATI Program should move beyond expanding the number of halal-certified SMEs toward strengthening the entire halal ecosystem. Nevertheless, this study is limited to three food SMEs in Yogyakarta and therefore reflects the characteristics of a specific regional context. Future studies are encouraged to validate the proposed readiness framework using quantitative or mixed-method approaches across different sectors and regions, while incorporating broader halal supply chain actors including suppliers, logistics providers, digital platforms, regulators, and consumers to develop a more comprehensive understanding of sustainable halal supply chain management in emerging halal economies.

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