

Designing Simple Performance Indicators for System Evaluation Digital Traceability in the Halal Industry (Case Study: Raja Kebab MSMEs Certified Halal, Pekalongan)

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Abstract

The mandatory halal certification policy in Indonesia accelerates MSME integration into the global halal ecosystem, though often viewed merely as an administrative hurdle. This study evaluates the digital traceability system of halal-certified MSMEs, using Raja Kebab in Pekalongan as a case study. Employing a mixed-methods approach and GAP analysis, data was collected via observation and questionnaires from owners and consumers. Findings reveal a critical operational gap: despite high consumer confidence, MSMEs lack fundamental traceability documentation. Production documentation showed the most severe gap (GAP 2.67), lacking SOPs and batch coding, relying entirely on the owner's memory. Distribution traceability showed a moderate gap (GAP 1.33) due to missing halal logos on packaging. The study recommends transitioning from memory-based operations to simple, cost-free digital traceability tools like Google Forms, Sheets, and POS applications. This framework offers a scalable, low-cost solution for micro-enterprises to maintain halal integrity and consumer trust.

Keywords: Digital Traceability, GAP Analysis, Halal Industry, MSMEs, Performance indicators.

1. Introduction

The Qur'an expressly provides comprehensive guidelines for mankind in consuming food. The guidelines are not only emphasized on the aspect of sharia legal ability (*halal*), but also include its quality, cleanliness, and goodness (*thayyib*). Allah SWT says in Surah Al-Baqarah verse 168:

يَا أَيُّهَا النَّاسُ كُلُوا مِمَّا فِي الْأَرْضِ حَلَالًا طَيِّبًا وَلَا تَتَّبِعُوا خُطُوَاتِ الشَّيْطَانِ إِنَّهُ لَكُمْ عَدُوٌّ مُبِينٌ ﴿١٦٨﴾

"O humans, eat some (food) on earth that is lawful and good and do not follow the steps of Satan. Indeed, he is an enemy to you the real thing."
(QS. Al-Baqarah: 168).

The divine command has now transformed into the main foundation for the development of the global halal industry. The concept of *halalan thayyiban* is no longer seen as a matter of exclusive religious rituals for Muslims, but has evolved into universally recognized quality, food safety, and hygiene standards (Sucipto et al., 2026). In Indonesia, this transformation was formally institutionalized through Law Number 33 of 2014 concerning Halal Product Assurance (JPH), which was then strengthened, simplified, and accelerated through Law Number 11 of 2020 concerning Job Creation. This latest regulation expands the mandate of halal certification obligations imperatively to touch the grassroots of the economy, namely the Micro, Small, and Medium Enterprises (MSMEs) sector (Lubis et al., 2022). This affirmative policy is an important pillar in realizing Indonesia's strategic vision as the center of the world's halal industry (Faisol, 2025). To realize this mandate, the Government through the Halal Product Assurance Agency (BPJPH) has facilitated MSMEs with a *self-declaration scheme*. This scheme is a regulatory breakthrough that allows micro business actors to obtain halal certificates for free and efficiently through assistance with the Halal Product Process (PPH) (Shokhikhah et al., 2023). Although the quantitative achievement of halal certificate issuance has experienced a massive surge thanks to the SEHATI (Free Halal Certification) program, a new and crucial structural problem has emerged in the post-certification phase (Fathoni et al., 2025). Many MSME actors view the issuance of halal certificates as the final line of fulfilling regulatory obligations, not as the starting point for a commitment to maintain *sustainable supply chain integrity* (Faikoh & Anwar, 2025). The absence of a structured self-monitoring system leads to high vulnerability to potential cross-contamination or the use of unverified substitute raw materials in the future.

The biggest operational challenge faced by post-certification MSMEs is a fatal weakness in the *traceability* system. Traceability is a vital element that ensures that the halal status of a product can be traced from upstream (suppliers) to downstream (consumers) without interruption (Kurniawan et al., 2025). In large-scale industries, traceability systems are generally automated using advanced technologies such as *Blockchain* or the *Internet of Things* (IoT) to minimize *human error* and data manipulation (Ahmed & Kamruzzaman, 2025). However, forcing the adoption of this high-level technology for micro-scale MSMEs is an operational impossible. MSMEs are often

hampered by limited digital literacy, minimal infrastructure, and the lack of financial capital for software investment (Astiwaru, 2023). This condition creates a striking *research gap*. The current academic literature is too focused on halal certification policy analysis or complex *blockchain-based traceability* technology designs. Very few studies offer pragmatic solutions in the form of simple and applicable performance indicators to evaluate the resilience of traceability systems at the level of traditionally managed micro-enterprises. Therefore, this research is here to design and implement simple performance indicators to evaluate the resilience of the traceability system, while offering a roadmap solution for the transition to *digital traceability* that is free of cost and easily accessible. A comprehensive case study was conducted on Raja Kebab MSMEs in Pekalongan City—a micro business entity that has successfully obtained halal certificates—to empirically reveal how the gap between operational realities in the field (*das sein*) and the ideal standards of the Halal Product Assurance System (*das sollen*) occurs.

2. Literature Review

2.1. Halal Supply Chain Integrity and Traceability Urgency

Halal supply chain management is an integrated paradigm that regulates the flow of materials, information, and processes to ensure that all stages from procurement to consumption are fully compliant with sharia principles (Kurniawan et al., 2025). The fundamental essence of this supply chain is not just logistics efficiency, but absolute prevention of cross-contamination between halal products and prohibited or unclean elements (Astiwaru, 2023). To maintain this integrity, the existence of a *traceability* system is a non-negotiable prerequisite. Adenan et al. (2025) affirm that traceability systems allow businesses to record production history with precision, which is not only vital to mitigate food safety risks, but also to build transparency that binds consumer trust psychologically.

2.2. Halal Product Assurance System (SJPH) in the Context of MSMEs

Based on the regulations issued by BPJPH, the implementation of SJPH requires business actors to comply with five main criteria: (1) commitment and responsibility, (2) ingredients, (3) halal product process (PPH), (4) products, and (5) monitoring and evaluation (Faikoh & Anwar, 2025). For MSMEs that take care of certification through a *self-declare scheme*, the fulfillment of these five criteria is highly dependent on the discipline and internal awareness of business owners (Munawar et al., 2023). The obligation to evaluate and periodically audit the internal audit mandated by regulations often comes to an impasse due to a very weak administrative record-keeping culture at the MSME level. As a result, halal status monitoring becomes unsystematic and vulnerable to accidental procedural violations.

2.3. Micro-Scale Digital Transformation: From Manual to Integrated Ecosystem

The concept of efficiency in modern supply chain management is often associated with the principles of *Lean* (reducing waste) and *Agile* (responsive to change) (Astiwaru, 2023). In the context of halal MSMEs, digitalization is the main catalyst to achieve this efficiency. Digital transformation in micro businesses does not require investment in ERP systems (*Enterprise Resource Planning*) or expensive *blockchain* infrastructure. Zulaika and Masyhuri (2026) found that the use of a *simple* spreadsheet application or Android-based point of sales system is more than enough to shift the conventional record-keeping paradigm that is prone to loss to a structured, accurate, and easily audited reporting system. Furthermore, Nento et al. (2026) prove that the digitization of record-keeping significantly reduces the risk of transaction recapitulation errors and provides valid historical data for strategic decision-making.

3. Research Methods

This research is designed using a *mixed-methods* approach with a descriptive-analytical case study. The use of case studies allows researchers to conduct an in-depth investigation of operational phenomena holistically in a natural environment without variable manipulation (Faisol, 2025). The object of the research is focused exclusively on Raja Kebab MSMEs in Pekalongan City. Primary data in this study was collected through participatory observation and in-depth interviews conducted directly by researchers at MSMEs Raja Kebab, Pekalongan, in April 2024.

The data processing in this study goes through several systematic stages. First, *supply chain mapping* is carried out through participatory observation from upstream to downstream. Second, the design of traceability performance indicators adapted from the SJPH criteria BPJPH. This indicator is translated into a questionnaire instrument on a Likert scale of 1-5 (1 = Very Bad/Never, 5 = Very Good/Always). Third, data collection was carried out through questionnaires and in-depth interviews involving MSME owners (*key informants*) and 10 active consumers selected using *purposive sampling techniques*.

Fourth, quantitative data is processed using *Gap analysis*. The formula used is to calculate the difference between the Actual Score (the average answer of the respondents) and the Ideal Score (maximum value of 5.00). The *Gap* values are then classified into repair priorities:

- **Gap 0.00 – 0.50:** Ideal / Very Well Managed Conditions.
- **Gap 0.51 – 1.00:** Low Priority (Good Condition, but requires minor refinement).
- **Gap 1.01 – 1.50:** Medium Priority (There are functional weak points that need improvement).
- **Gap > 1.50:** High/Critical Priority (Hazardous conditions that demand immediate fundamental corrective action).

The last stage is the formulation of strategic recommendations for improving the management system towards *simple and applicable* digital traceability.

4. Results and Discussion

4.1. Operational Profile and Legality of MSMEs of Raja Kebab

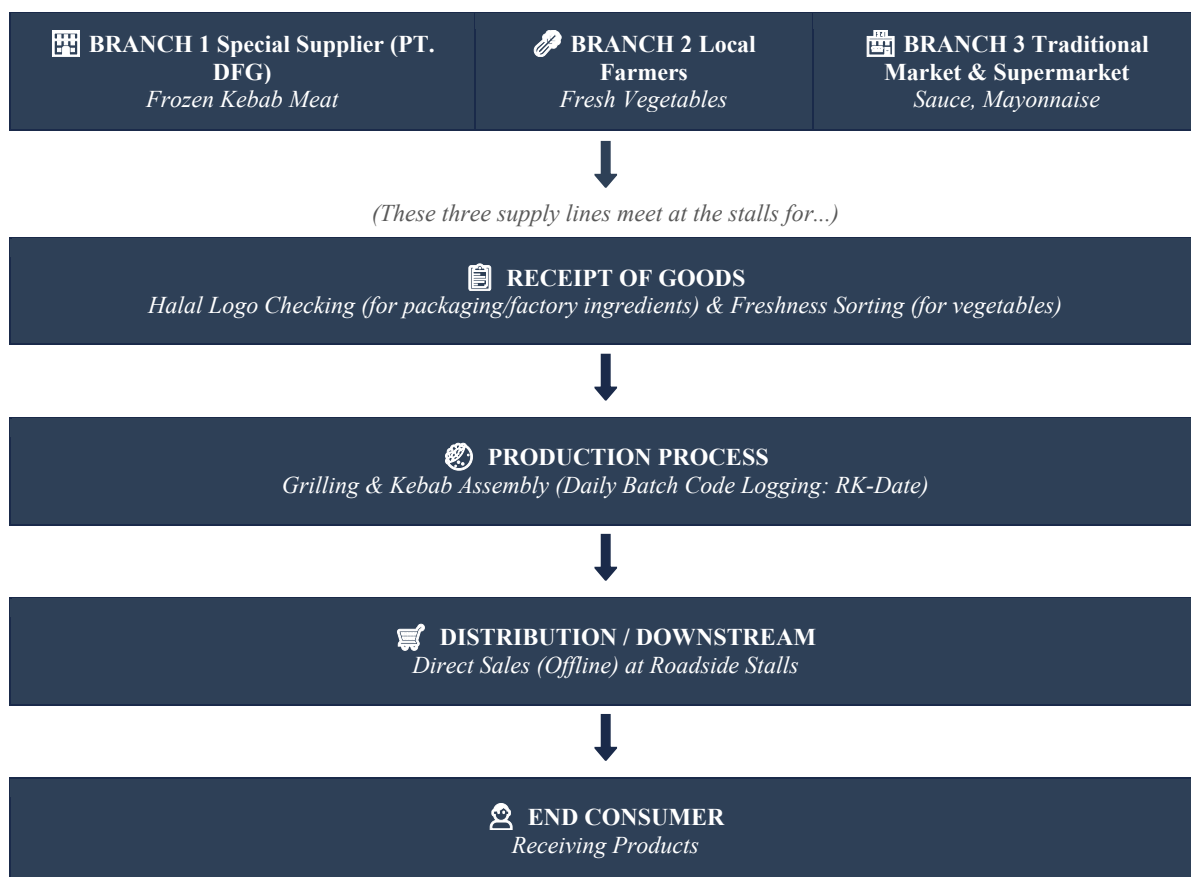
Raja Kebab is a micro culinary business entity managed independently by Muhammad Tavika Iriyanto. It operates in the Krapyak Kidul GG area. 8, North Pekalongan District, Pekalongan City, this business produces fast food with the main product line in the form of kebabs and burgers. The daily production capacity reaches approximately 70 portions, which are distributed to consumers through a direct sales system at cart stalls and online ordering integration via *GoFood services*.

The legal significance of these MSMEs lies in their success in obtaining halal legitimacy from the state. Raja Kebab holds a BPJPH Halal Certificate with a registration number ID33110016492240324 which was officially issued on April 2, 2024. This achievement normatively indicates that raw materials and production facilities have gone through the verification stage of PPH assistance. However, further analysis is needed to test whether this legal status is balanced with continued operational integrity.

4.2. Supply Chain Mapping

Observational analysis of the flow of material movement in Raja Kebab reveals a supply chain model that is linear, simple, but has an absolute point of dependence on third-party integrity. The procurement of the main raw material, namely processed ground beef, is supplied by a special distributor of kebabs. The meat is received in a frozen state (in the form of a roll or large skewer) and most vitally: the primary packaging has been equipped with the manufacturer's official halal logo. The availability of certified raw materials at the supplier level makes it easier for MSME actors to maintain sharia compliance upstream of the supply chain (Faikoh & Anwar, 2025).

Meanwhile, for the supporting material components, Raja Kebab applies a separate procurement channel. Fresh vegetables are supplied directly by local farmers to ensure quality and daily freshness. On the other hand, complementary ingredients such as bread, mayonnaise, and various sauces are obtained by the owners through independent purchases at traditional markets and local supermarkets. The entire product assembly process is then carried out centrally in the sales stall. The processing flow includes: slicing of grilled meat on a *vertical burner*, preparation of vegetables, assembly on sheets of tortillas with sauce and mayonnaise, rolling, until it is served directly to consumers. This business model is purely *Business-to-Consumer* (B2C) based, where there are no intermediary distribution channels.



4.3. Results of System Performance Indicator Assessment

The evaluation of the traceability system is dissected from two complementary perspectives: the perspective of the owner as the upstream controller of operations, and the perspective of the consumer as the downstream assessor.

Table 1: Performance Indicator Score Recapitulation – MSME Owner's Perspective

No	SJPH Evaluation Indicators	Actual Score	Ideal Score	Value GAPS	Priority Status
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1	Supplier Verification & Halal Meat	4.33	5.00	0.67	Low (Good)
2	Material Receipt Record Baku	4.67	5.00	0.33	Very Low
3	Production Process Documentation & Presentation	2.33	5.00	2.67	Critical (High)
4	Material Storage Management & Products	5.00	5.00	0.00	Ideal
5	Distribution Traceability & Sales	3.67	5.00	1.33	Medium

Based on Table 1, the main advantage of these MSMEs lies in storage management (Perfect Score 5.00). Owners strictly separate meat storage from other ingredients and discipline the *First In First Out* (FIFO) system inside the refrigeration facility, minimizing the risk of cross-contamination and spoilage (Adenan et al., 2025). However, the Production Process Documentation indicator plummeted drastically to a score of 2.33, indicating the absence of written procedures at all.

Table 2: Performance Indicator Score Recapitulation – Consumer Perspective (n=10)

No	Consumer Perception Indicators	Actual Score	Ideal Score	Value GAPS	Priority Status
1	Consumer Awareness of Status Halal	3.73	5.00	1.27	Medium
2	Belief in Halal Products	4.13	5.00	0.87	Low (Good)
3	Halal Information Accessibility Physical	3.50	5.00	1.50	Medium
4	The Influence of Halal Labels thd Buy Decision	3.43	5.00	1.57	High (Critical)
5	Satisfaction thd Transparency MSMEs	4.23	5.00	0.77	Low (Good)

From the perspective of consumers (Table 2), a paradox can be seen. Despite the belief in Product halalness is quite solid (4.13), consumers give critical scores on the Influence of Halal Labels on Purchase Decisions (3.43 / GAP 1.57) and Accessibility of Physical Information (GAP 1.50). The absence of halal visual attributes on packaging makes consumers not have independent validation instruments (Rizki & Susanti, 2025).

4.4. GAP Analysis: Unraveling Fundamental Vulnerabilities

Data quantification facilitates more precise gap analysis, revealing a huge hole in the sustainability of halal product integrity in Raja Kebab MSMEs.

a. Production Documentation Gap (GAP 2.67) – Critical Priority

The most dangerous gap is the total dysfunction of production documentation. A GAP score of 2.67 represents systemic failure. Currently, all seasoning formulas and hygiene procedures are stored exclusively in the business owner's cognitive memory. There is absolutely no written *Standard Operating Procedure* (SOP) or *batch* production coding system. From the perspective of supply chain management efficiency (Astiwaru, 2023), this memory-based management is a fatal threat. If the owner is unable to attend or delegate operations, product inconsistencies and potential violations of halal boundaries will be very easy to occur.

b. Distribution and Visualization Traceability Gap (GAP 1.33 – 1.57) – Upper Middle Priority

The gap at the downstream point stems from discriminatory transaction recording and the absence of visual communication. The owner admits to only recording orders if the quantity exceeds five servings, leaving dozens of daily individual transactions unrecorded. On the other hand, the absence of a halal logo on the primary packaging of kebabs makes consumers not have independent verification instruments. Although MSMEs have successfully managed halal certificates, the added value of these certifications has failed to be capitalized into a marketing strategy. Muslim consumers in the modern era make physical labels as the main heuristic in purchasing decisions (Rizki & Susanti, 2025).

c. Supplier Verification Gap (GAP 0.67) – Procedural Gap

There is a procedural gap in the upstream process, where MSMEs do not have a written database or digital archive containing official Halal Certificate documents from suppliers. The reliance on blind trust without document archiving is contrary to the SJPH principle which requires document proof at every change of material ownership throughout the supply chain (Kurniawan et al., 2025).

4.5. Transformation Comparison: Manual Conditions vs Digital Integration

Maintaining a current manual system is the same as maintaining an operational time bomb. Absolute reliance on individual memory creates a fragmented governance that is highly susceptible to data manipulation or loss. Instead, the paradigm shift towards digital systems integration offers revolutionary operational stability. Digitization ensures that every trace of material movement is permanently recorded in cloud storage. Data transforms from mere personal memory to a structured institutional asset and facilitates instant internal audits (Zulaika & Masyhuri, 2026).

4.6. Applicable Recommendations: Designing Micro-Scale Digital Traceability

Based on the synthesis of gap analysis above, this study formulates recommendations for digital traceability architecture designed specifically for micro MSMEs with a no-cost approach.

Mitigating Demographic Barriers through the Google Forms Interface

The implementation of digital traceability on a micro scale is often faced with demographic barriers, namely low digital literacy among operational employees. Forcing data to be filled in directly on a spreadsheet has the potential to cause resistance and increase human error.

As an applicative solution, this system uses *Google Forms* as the *front-end user interface*. *Google Forms* digitizes the procedure through *multiple-choice* questions and *dropdown* menus. Thus, operational employees do not need to do manual typing, but simply press the standardized option (for example, choosing the name of the supplier or checking the status of the halal logo). All data input through *Forms* will be integrated and recapitulated automatically (*real-time*) into *Google Sheets* as a central database (*back-end database*) managed by business owners.

Step 1: Institutionalization of Written SOPs and Batch Coding

MSMEs are required to prepare SOPs for presentation in writing. Simultaneously, the implementation of daily batch coding is implemented using the initials and date formats (example: RK08052026). This code becomes the anchor of *backward traceability* in the event of quality complaints (Nento et al., 2026).

Step 2: Visualization of Halal Identity on Physical Packaging

The inclusion of halal attributes on primary packaging is an absolute must. MSMEs are advised to produce stickers or print wrapping paper containing the National Halal Logo and BPJPH Registration Number in its entirety. This action will educate the public that the product is under the supervision of legitimate state regulations (Faikoh & Anwar, 2025).

Step 3: Digitize Daily Transaction Recording

In order to automate distribution traceability, the adoption of smartphone-based non-paid *Point of Sales* (POS) technology is highly recommended. This application records every sales transaction in *real-time* while securing forward *traceability* records (Zulaika & Masyhuri, 2026).

Step 4: Build a Digital Supplier Database

The owner is required to request a digital copy (photo or PDF) of the Halal Certificate from the supplier.

The copy is uploaded and archived into a free cloud computing service (*Google Drive*). This digital archiving creates a standardized and secure supplier database (Astiwar, 2023).

5. Conclusions and Suggestions

This study proves that the acquisition of halal certificates for micro business entities, such as Raja Kebab MSMEs, is not automatically directly proportional to the maturity of the Halal Product Assurance System at the operational level. Performance indicator-based evaluations reveal inequality: although storage management is running ideally, the production documentation and traceability aspects are severely deficiated (GAP 2.67). Operational management that relies absolutely on the owner's memory creates a vulnerability to quality inconsistency and cross-contamination. In addition, the absence of a halal logo on physical packaging causes MSMEs to fail to capitalize on the value of halal certificates in the eyes of consumers.

Therefore, intervention in the form of designing a simple *digital traceability system* is a must. A pragmatic transition to the formulation of written SOPs, the implementation of daily batch coding, the digitization of transaction records using *Google Forms* and *Google Sheets*, and the archiving of proof of supplier certificates in cloud computing, are no-cost tactical solutions that provide maximum protection. For policymakers such as BPJPH, this study suggests that halal certification programs be followed by post-certification mentoring that focuses on basic digital literacy training.

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