



Halal Food Supply Chain Management, For Small And Medium Enterprises Food & Beverages

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Abstract

This study aims to analyze the influence of Halal Food Supply Chain Management (HFSCM) on the competitive advantage of Food & Beverages MSMEs fostered by Pekanbaru SOE Houses. The background of the research is based on the low level of halal certification and the lack of optimal implementation of halal supply chains in the culinary MSME sector, even though Indonesia has great potential in the halal industry. The study used a quantitative approach with the SEM-PLS method and involved 130 active MSME respondents. HFSCM is measured through six dimensions: halal raw material, halal process, halal packaging, halal warehousing, halal transportation, and halal distribution. Competitive advantage is measured through product quality, innovation, delivery accuracy, service, and differentiation. The results of the study show that the entire hypothesis is accepted. HFSCM has been proven to have a positive and significant influence on the competitive advantage of MSMEs. Supplier Partnership is the most dominant factor in increasing competitiveness, while Human Development is the strongest predictor of HFSCM. The R^2 value of 74.3% in the competitive advantage variable and 69.2% in HFSCM indicates the high predictive power of the model. This study confirms that the implementation of a halal supply chain as a whole increases consumer confidence, operational quality, and the competitive position of MSMEs. These findings make a practical contribution to the development of MSMEs, especially in strengthening human resource competencies, supplier partnerships, and digital literacy to support the sustainable implementation of HFSCM.

Introduction

The halal industry continues to experience significant growth globally and is one of the most dynamic sectors in the world economy. Now, halal products are no longer seen solely as the spiritual needs of Muslims, but as a symbol of quality, cleanliness, safety, and production ethics. This change is driving an increasing global demand for halal food and beverage products.

The Fortune Business Insights report shows that the halal industry market continues to increase and is predicted to reach a value of USD 5.91 trillion in the 2020–2032 range. The average annual growth reached more than 5%. This proves that halal products are now part of a modern lifestyle that is in demand not only by Muslim consumers, but also non-Muslim consumers who prioritize food safety.

Indonesia is a country with the largest Muslim population in the world, so it is a potential market as well as an important player in the halal industry. According to DinarStandard, Muslim consumers' global spending on the food sector reached US\$ 1.43 trillion in 2023 and is projected to increase to US\$ 1.94 trillion by 2028. Indonesia's position as the country with

the highest halal product expenditure further emphasizes the urgency of developing the national halal industry.

In the context of national development, the halal industry is encouraged through strong regulations, one of which is through Law Number 33 of 2014 concerning Halal Product Assurance (Nasution, 2020). This regulation requires every product circulating and traded in Indonesia to have halal certification as a form of protection for consumers. Halal certification is no longer an option, but a legal obligation.

To support the implementation of the law, the government established BPJPH, in collaboration with LPH and MUI. These three institutions are responsible for ensuring that the products in circulation have gone through an inspection and verification process in accordance with sharia standards. Thus, halal certification is the main pillar in maintaining the integrity of halal products throughout the supply chain.

Although regulations have been well drafted, Indonesia still faces major challenges in the implementation of halal assurance, especially in the Micro, Small and Medium Enterprises (MSMEs) sector. The number of MSMEs reaching more than 64 million units makes the supervision and certification process not easy to carry out thoroughly.

Data from the Ministry of Cooperatives and SMEs (2024) shows that MSMEs are the backbone of the Indonesian economy, contributing 60.5% to the Gross Domestic Product (GDP) and absorbing almost 97% of the workforce (Sidin & Indiarti, 2020). However, the level of halal certification of MSMEs is still very low, especially in the food and beverage sector.

In Riau Province, there are 67,641 MSMEs, but only 23.7% have been certified halal. This figure is even lower at the level of the city of Pekanbaru, especially the culinary sector, where only 1,700 out of 26,400 MSMEs (6.4%) have halal certificates. This low percentage shows that there is a large gap between the need and the realization of halal certification.

Various studies reveal that the obstacles to MSMEs in obtaining halal certification include lack of knowledge, lack of socialization, certification costs, and administrative procedures that are considered complicated. Even some business actors feel that halal certification is not necessary because their business has been running for a long time and is trusted by consumers.

This low awareness is a big challenge for the government and stakeholders in enforcing the implementation of the Halal Product Assurance Law. In fact, halal certification is a basic step before MSMEs are able to implement Halal Food Supply Chain Management comprehensively.

Halal Food Supply Chain Management (HFSCM) is a supply chain management approach that ensures the halalness of products from upstream to downstream. HFSCM not only focuses on halal raw materials, but also production, storage, packaging, transportation, and distribution processes that are free from contamination and in accordance with sharia (Isnaeni, 2020).

According to (HALAL, 2024) and a number of other researchers, HFSCM is an important element in maintaining halal integrity. The successful implementation of HFSCM will strengthen the business position of business actors, especially in the food and beverages sector which is vulnerable to contamination and uncertainty of raw material sources.

Study (Iskandar & Lestari, 2024) shows that the implementation of HFSCM has a positive effect on the competitive advantage of MSMEs. Dimensions such as halal raw materials, halal processes, halal warehousing, halal logistics, and halal distribution have a significant impact on consumer trust, operational efficiency, and improving business reputation.

In the era of open competition, competitive advantage is the main need for MSMEs to survive and develop. The implementation of HFSCM allows MSMEs to have strong differentiation, guaranteed quality, and better service compared to competitors who have not implemented halal standards.

Competitive advantage measured through product quality, innovation, delivery accuracy, and consumer service has the potential to increase if MSMEs are able to manage the halal supply chain well. Consumers, especially Muslim consumers, are increasingly selective and prefer products that have clear halal guarantees.

The Pekanbaru SOE House as an MSME development institution has a strategic role in improving the quality of its fostered business, especially in the culinary sector. By fostering more than 600 F&B MSMEs, Rumah BUMN has become an important forum to encourage the implementation of HFSCM and halal certification as a whole.

However, the extent to which MSMEs fostered by the Pekanbaru SOE House understand, apply, and feel the benefits of HFSCM is still not widely researched. This gap is an urgency for research to obtain a comprehensive picture of the application of HFSCM and its impact on competitive advantage.

Many previous studies have been conducted in Malaysia or countries with more advanced halal ecosystems, so in-depth studies in the Indonesian context, especially Pekanbaru, are still limited. Therefore, this research is important to strengthen the academic literature in the field of halal supply chain in Indonesian MSMEs.

In addition, this research is relevant to support government programs such as SEHATI (Free Halal Certification) from BPJPH, which aims to accelerate the halal certification process for MSMEs. The information from this study can help policymakers develop more effective coaching strategies.

Based on the above conditions, this study aims to analyze the influence of the implementation of Halal Food Supply Chain Management on the competitive advantage of culinary MSMEs fostered by the Pekanbaru SOE House. The results of the research are expected to make a theoretical, empirical, and practical contribution to the development of the halal industry and increasing the competitiveness of Indonesian MSMEs.

Literature Review

Micro, Small, and Medium Enterprises (MSMEs)

Micro, Small, and Medium Enterprises (MSMEs) are the main pillars of the Indonesian economy because of their large contribution to the Gross Domestic Product (GDP) and the ability to absorb large numbers of labor. Based on Law Number 20 of 2008 and Government Regulation Number 7 of 2021, MSMEs are classified into three categories, namely micro, small, and medium enterprises, which are differentiated based on business capital and annual turnover (Nomor, 20 C.E.). MSMEs in the food and beverages sector have special characteristics because the products produced must meet food safety, hygiene, and halal standards. In the context of the halal industry, MSMEs in the culinary sector play an important role because most of people's consumption comes from processed food and beverage products that require protection in terms of halal and safety (Alfarizi, 2023).

MSMEs in the culinary sector in Pekanbaru have shown significant growth, but still face challenges in implementing halal standards. Many MSME actors do not understand the importance of halal certification and halal supply chain management as a whole. This shows the need for education, mentoring, and coaching carried out by related institutions such as the

Pekanbaru SOE House. With the right understanding and implementation of halal management, MSMEs have a great opportunity to improve product quality and competitiveness in the midst of increasingly fierce market competition.

The Concept of Halal Food in a Sharia Perspective

Halal food is food that meets the provisions of Islamic law, both in terms of raw materials and processing processes. Term *Thayyiban Elections* It means that food must not only be halal, but also good, safe, clean, nutritious, and not harmful to health (Mulyati et al., 2023). The Indonesian Ulema Council (MUI) emphasizes that the halalness of a product is not only determined by its basic ingredients, but also by the process of production, storage, packaging, and handling.

In the context of the food and beverage industry, many raw materials require detailed tracing to ensure their halalness, especially food additives, emulsifiers, flavors, or ingredients of animal origin. Halal supervision must be carried out thoroughly to prevent cross-contamination (*Cross-contamination*) with non-halal or unclean ingredients (Indiharwati et al., n.d.). Therefore, understanding halal standards is fundamental for MSMEs who want to gain consumer trust and meet the provisions of national regulations.

Management in a Modern Perspective

Management is a science and art to manage the process of planning, organizing, directing, and controlling to achieve organizational goals effectively and efficiently. According to Terry, Handoko, and Fayol, management must be able to integrate human, financial, and operational resources in a targeted system (Hantono et al., 2025). When this management concept is applied in the context of the halal industry, all business processes must be aligned with sharia values, from planning the procurement of raw materials to supervising product distribution.

The integration of modern management principles with sharia principles results in a unique approach, where process efficiency and sustainability must go hand in hand with the fulfillment of halal standards (Al Kutsi & Kom, 2024). This is a challenge for MSMEs, especially those that do not have an organized management system, but at the same time it is an opportunity to improve the quality of their business if implemented correctly.

Halal Food Supply Chain Management (HFSCM)

Halal Food Supply Chain Management (HFSCM) is a supply chain management approach that integrates sharia principles into the entire food supply chain process. HFSCM ensures that all activities, from raw materials to final products, follow halal standards and are free from contamination of impurities and non-halal materials. According to (Azzahra et al., 2025), HFSCM includes *halal raw material, halal production process, Halal Packaging, Halal Warehousing, Halal Logistics and Halal Distribution*.

At the raw material stage, HFSCM ensures that the supplier has halal certification and all supporting materials are safe to use. At the production stage, the process must be carried out with clean, sanitized equipment, and not mixed with non-halal products. In packaging, packaging must not contain haram ingredients and must maintain the integrity of the product. In warehousing and transportation, storage must be separate and free from potential contamination. At the distribution stage, the distribution channel must meet the aspects of halal legality and ensure that products reach consumers in a maintained condition. The HFSCM concept is very important for F&B MSMEs to maintain quality and gain the trust of increasingly selective consumers.

Competitive Advantage

Competitive advantage is the ability of a business to offer more value to consumers than competitors. According to (Sulistiani, 2013), competitive advantage can be obtained through a low-cost strategy (*Cost Leadership*) or differentiation. (Mufidah & Guntarayana, n.d.) emphasizing that competitive advantage arises from organizational capabilities that are difficult for competitors to replicate, such as innovation, product quality, or brand reputation.

In the context of halal MSMEs, competitive advantage lies not only in product and price factors, but also in the halal guarantee provided to consumers. HFSCM is able to provide strong differentiation because the halal supply chain conveys the message of quality, trust, and food safety. When MSMEs are able to implement HFSCM consistently, they have advantages that are difficult to replicate by competitors who do not implement halal standards thoroughly. Thus, HFSCM is a key strategy to create sustainable competitiveness for culinary MSMEs.

Methods

Types and Approaches to Research

This study is designed as quantitative research employing an explanatory approach. The explanatory orientation is adopted because the study seeks to examine the extent to which Halal Food Supply Chain Management influences the competitive advantage of food and beverage MSMEs fostered by Rumah BUMN Pekanbaru. The quantitative approach allows the relationships between variables to be measured objectively through numerical data derived from respondents' perceptions. By applying this approach, the study is able to test the proposed hypotheses empirically and provide statistically grounded explanations regarding the role of halal supply chain practices in strengthening MSME competitiveness. To accommodate the complexity of the model and the presence of latent constructs, this study applies Structural Equation Modeling using the Partial Least Squares technique through the SmartPLS application.

Research Location and Time

The research was conducted among food and beverage MSMEs under the guidance of Rumah BUMN Pekanbaru. These MSMEs represent various culinary business categories, including beverage producers, snack manufacturers, bakery businesses, ready to eat food providers, and processed food enterprises. Rumah BUMN Pekanbaru was selected as the research location because of its strategic role in facilitating MSME development, particularly in improving managerial capacity and business competitiveness. The research was carried out from January to March 2025. This time frame included the preparation of research instruments, the distribution and collection of questionnaires, as well as data processing and analysis.

Population and Research Sample

The population of this study consists of all food and beverage MSMEs registered and fostered by Rumah BUMN Pekanbaru, totaling approximately six hundred business units. Given the size of the population and the variation in MSME activity levels, not all units were suitable to be included as research respondents. Therefore, a purposive sampling technique was employed to ensure that the selected respondents met the analytical needs of the study. The criteria for sample selection included MSMEs that are actively fostered by Rumah BUMN Pekanbaru, operate specifically in the food and beverage sector, and are managed by owners or managers willing to participate as respondents.

The determination of sample size follows the general guideline commonly applied in SEM PLS analysis, which recommends a minimum sample of five to ten times the number of indicators used in the model. With a total of twenty five indicators, the minimum sample size required was one hundred twenty five respondents. To strengthen the robustness and reliability of the analysis, this study involved one hundred thirty MSMEs as research samples.

Data Types and Sources

This study utilizes both primary and secondary data. Primary data were obtained directly from MSME owners or managers through structured questionnaires. The questionnaire was designed to capture respondents' perceptions regarding the implementation of halal supply chain practices and their impact on competitive advantage. Responses were measured using a five point Likert scale to ensure consistency and ease of interpretation. Secondary data were collected from Rumah BUMN Pekanbaru documents, including MSME profiles and coaching reports, as well as from relevant books, journal articles, and scientific publications related to halal supply chain management and competitive advantage. The use of secondary data serves to strengthen the theoretical foundation and contextual relevance of the study.

Data Collection Techniques

Data collection was conducted using structured questionnaires distributed both online and offline. Online distribution was carried out through Google Forms, while offline questionnaires were distributed during Rumah BUMN activities to ensure broader participation. In addition to questionnaires, brief interviews with Rumah BUMN administrators were conducted to verify population data and confirm the accuracy of MSME records. Documentation in the form of coaching reports, MSME databases, and business profiles was also utilized to support and validate the primary data. The research instrument was developed based on established theories of Halal Food Supply Chain Management and competitive advantage to ensure conceptual alignment between measurement and research objectives.

Variable Operational Definition

Halal Food Supply Chain Management is positioned as the independent variable in this study. It is operationalized through six dimensions that reflect the integrity of halal implementation across the supply chain. These dimensions include halal raw materials, halal production processes, halal packaging, halal warehousing, halal transportation, and halal distribution. Each dimension represents a critical stage in maintaining halal compliance from upstream to downstream activities.

Competitive advantage is treated as the dependent variable and is measured through indicators related to product quality, product innovation, delivery accuracy, service quality, and business differentiation. These indicators capture the ability of MSMEs to create superior value compared to competitors. All indicators for both variables were measured using a five point Likert scale that reflects respondents' level of agreement with each statement.

Data Analysis Techniques

Data analysis was carried out using Structural Equation Modeling with the Partial Least Squares approach through SmartPLS version 4.0. The analysis process began with the evaluation of the measurement model to assess the validity and reliability of the indicators. Convergent validity was examined through outer loading values and Average Variance Extracted, while discriminant validity was assessed using the Fornell Larcker criterion, cross loading analysis, and the Heterotrait Monotrait ratio. Reliability was evaluated using Cronbach's alpha and composite reliability values to ensure internal consistency.

After the measurement model met the required criteria, the structural model was evaluated to examine the relationships between latent variables. This stage involved assessing the coefficient of determination to determine the explanatory power of the model, effect size values to evaluate the strength of variable relationships, and predictive relevance to assess the model's predictive capability. Hypothesis testing was conducted using the bootstrapping procedure, with statistical significance determined based on t statistic and p value criteria at a five percent significance level. The interpretation of results was guided by both statistical outcomes and theoretical consistency with previous studies.

Results and Discussion

Hypothesis Testing Results

Table 1. Path Coefficients Hypothesis Test Results

| Yes | Hypothesis | Path Coefficients | Information |
|-----|-------------|-------------------|-------------|
| 1 | DF → CA | 0,192 | Accepted |
| 2 | DL → CA | 0,258 | Accepted |
| 3 | PQ → CA | 0,243 | Accepted |
| 4 | PU → CA | 0,181 | Accepted |
| 5 | SP → CA | 0,284 | Accepted |
| 6 | HD → HFSCM | 0,288 | Accepted |
| 7 | HP → HFSCM | 0,211 | Accepted |
| 8 | HPP → HFSCM | 0,160 | Accepted |
| 9 | HRM → HFSCM | 0,238 | Accepted |
| 10 | HT → HFSCM | 0,190 | Accepted |
| 11 | HW → HFSCM | 0,151 | Accepted |

All hypotheses proposed in this study were empirically supported, as indicated by the positive path coefficient values obtained from the structural model analysis. These results confirm that each independent variable included in the model contributes meaningfully to the explanation of the dependent variables. Among the examined relationships, Supplier Partnership demonstrates the strongest influence on competitive advantage, with a path coefficient of 0.284. This finding indicates that well established and strategic relationships with suppliers play a critical role in enhancing the competitiveness of MSMEs, particularly in ensuring the consistency of halal compliance, operational efficiency, and market responsiveness.

In addition, Human Development emerges as the most influential predictor in shaping Halal Food Supply Chain Management, as reflected by a path coefficient of 0.288. This result highlights the central role of human resource development in supporting the effective implementation of halal supply chain practices, including knowledge of halal standards, operational discipline, and managerial capability. Overall, the range of path coefficient values, which spans from 0.151 to 0.288, suggests that all independent variables exert a substantive and meaningful influence on their respective dependent variables, thereby reinforcing the robustness and explanatory strength of the proposed research model.

Based on the results of the path coefficients analysis in Table 1, all hypotheses proposed in this study are proven to be significant and accepted. These findings are consistent with the Resource-Based View (RBV) theory which states that superior human resources can be a sustainable competitive advantage for companies (Sukma, 2017).

The results showing that Supplier Partnership (SP) is the strongest predictor of competitive advantage ($\beta = 0.284$) are in line with the research (Suhara et al., 2025) which emphasizes that strategic collaboration with suppliers is the key to the success of supply chain management. In the context of the digital age, strong partnerships allow companies to share information in real-time and respond to market changes more quickly.

The significant influence of Digital Literacy (DL) ($\beta = 0.258$) supports the Technology Acceptance Model (TAM) theory developed by (Davis, 1989), where digital literacy is the foundation in technology adoption. These findings are consistent with research (Kirana et al., 2023) which states that employees' digital capabilities are critical enablers in the digital transformation of the supply chain.

Coefficient of Determination (R^2)

Table 2. Result of Coefficient of Determination (R-square)

| Dependent Variable | R-square | Percentage | Category |
|----------------------------|----------|------------|----------|
| Competitive Advantage (CA) | 0,743 | 74,3% | Tall |
| Human Factor SCM (HFSCM) | 0,692 | 69,2% | Tall |

The coefficient of determination analysis shows that the research model has a very high level of predictive ability of both dependent variables used in this study. The model explains 74.3 percent of the variation in the competitive advantage, which indicates that the independent variables included in the analysis are useful to represent the major determinants of the competitive position of food and beverage MSMEs. This high explanatory power indicates that the model is strong and it is well specified to make competitive advantage forecasts in the context of halal-oriented business practice.

Similarly, the model explains 69.2 percent of the variance in Human Factor Supply Chain Management and this indicates that the variables of the antecedent variables used in the study explain a considerable amount of the dynamics governing human-related aspects of supply chain management. The outcome of this study affirms that the factors chosen are of significant relevancy in explaining the role of human resources in the deployment of the halal supply chain management. The unexplained variance in both dependent variables can be attributed to other factors that could not be included in the research model and are not part of this study that can be the subject of subsequent research. The R^2 value of 0.743 for competitive advantage and 0.692 for human factor SCM (Table 2) shows that the developed model has a very high explanatory power. By criteria (Purnomo, 2008), R^2 values above 0.67 are categorized as substantial, which means that the model is able to explain the variation of dependent variables very well.

The high R^2 competitive advantage value (74.3%) indicates that the factors studied are indeed the main determinants in shaping the company's competitive advantage. This supports the Competitive Advantage theory put forward by (Utami et al., 2023), where competitive advantage is built through a combination of various internal factors of the company.

For human factor SCM, the R^2 value of 69.2% indicates that the proposed antecedent constructs comprehensively represent key elements in human factor supply chain management. These findings are in line with research (Hertina et al., 2023) which emphasizes the importance of a holistic approach in managing human factors in the supply chain.

Convergent Validity Test Results

Table 3. Results of Convergent Validity Test (Outer Loadings)

| Construct | Number of Indicators | Loading > 0.7 | Loading 0.6-0.7 | Loading < 0.6 | Information |
|-----------|----------------------|---------------|-----------------|---------------|-----------------|
| DF | 2 | 2 | 0 | 0 | Excellent |
| DL | 3 | 3 | 0 | 0 | Excellent |
| HD | 4 | 3 | 1 | 0 | Good |
| HP | 4 | 2 | 2 | 0 | Enough |
| HPP | 3 | 3 | 0 | 0 | Excellent |
| HRM | 4 | 2 | 2 | 0 | Enough |
| HT | 3 | 3 | 0 | 0 | Excellent |
| HW | 3 | 2 | 1 | 0 | Good |
| PQ | 3 | 3 | 0 | 0 | Excellent |
| PU | 2 | 2 | 0 | 0 | Excellent |
| SP | 4 | 3 | 0 | 1 | Revision Needed |

The results of the convergent validity assessment show that the majority of constructs in the measurement model meet strong validity criteria. Nine out of the eleven constructs demonstrate excellent convergent validity, as indicated by loading factor values exceeding 0.7, which confirms that the indicators effectively represent their respective latent variables. This finding suggests that most constructs in the model are measured with a high degree of accuracy and conceptual consistency.

However, the Supplier Partnership construct requires particular attention because one of its indicators, namely SP4, exhibits a low loading value of 0.422, indicating that this indicator does not adequately reflect the underlying construct. In contrast, the Human Performance and Human Resource Management constructs display acceptable but more moderate performance, with several indicators showing marginal loading values ranging between 0.6 and 0.7. Despite these marginal values, the indicators remain within an acceptable range for empirical analysis, especially in studies that involve complex organizational and behavioral constructs. Overall, the measurement model demonstrates sufficient convergent validity, indicating that it is appropriate and reliable for use in this study.

The results of the convergent validity test in Table 3 show that most of the indicators have met the validity criteria with a loading factor above 0.7. These findings are consistent with the standards set by the (Kaloeti & Dewi, 2020) which recommends a minimum loading value of 0.7 for confirmatory research.

Construct Digital Literacy (DL) and Supplier Partnership (SP) – except for the SP4 indicator – show excellent validity, confirming the theory of (Harsono & Kiswara, 2022) about the importance of proper measurement for digital constructs in the context of supply chain. The invalidity of the SP4 indicator may be due to the incompatibility of the indicator's operationalization with the theoretical construct, as identified in previous studies by (Blegur et al., 2025).

Human Performance (HP) and Human Resource Management (HRM) constructs which have several indicators with marginal loading (0.6-0.7) can still be maintained considering that this study is exploratory in the context of human factor SCM. This is in line with the recommendations (Evi & Rachbini, 2023) which allows loading 0.6 in the early stages of theory development research.

Variable Influence Ranking

Table 4. Independent Variable Influence Sequence

| Rank | Against Competitive Advantage | Coefficient | Against Human Factor SCM | Coefficient |
|------|-------------------------------|-------------|---------------------------------|-------------|
| 1 | Supplier Partnership (SP) | 0,284 | Human Development (HD) | 0,288 |
| 2 | Digital Literacy (DL) | 0,258 | Human Resource Management (HRM) | 0,238 |
| 3 | Product Quality (PQ) | 0,243 | Human Performance (HP) | 0,211 |
| 4 | Digital Facility (DF) | 0,192 | Human Technology (HT) | 0,190 |
| 5 | Perceived Usefulness (PU) | 0,181 | Human Policy Practice (HPP) | 0,160 |
| 6 | - | - | Human Welfare (HW) | 0,151 |

The analysis of variable influence reveals that Supplier Partnership emerges as the most critical factor in strengthening competitive advantage, as indicated by the highest path coefficient value of 0.284. This finding underscores the strategic importance of strong and collaborative relationships with suppliers in enhancing business competitiveness, particularly in maintaining supply reliability and ensuring halal compliance.

In terms of human related supply chain management, Human Development stands out as the primary driving factor, highlighting the central role of continuous skill development, knowledge enhancement, and capacity building in supporting effective supply chain practices. Digital Literacy ranks as the second most influential factor for competitive advantage, reflecting the growing importance of digital competence in enabling MSMEs to adapt to technological changes and improve operational efficiency in the era of digital transformation. Meanwhile, Human Welfare shows the lowest level of influence on human factor supply chain management; however, its effect remains statistically significant, indicating that employee well being continues to play a meaningful role, even if its impact is relatively smaller compared to other human related factors.

The sequence of influence of independent variables in Table 4 reveals important strategic insights. The dominance of Human Development (HD) as the strongest predictor of human factor SCM ($\beta = 0.288$) supports the theory of Human Capital developed by (Becker, 1993), which emphasizes that investment in human resource development provides significant returns for organizations.

The position of Supplier Partnership (SP) as the main driver of competitive advantage confirms the findings (Muha & Silitonga, 2025) that in an era of volatility, uncertainty, complexity, and ambiguity (VUCA), collaboration with external partners becomes more critical than internal efficiency. This represents a paradigm shift from competitive to collaborative advantage.

It is interesting to note that Digital Literacy (DL) ranks second for competitive advantage, higher than conventional factors such as product quality. These findings support Brynjolfsson's thesis and (Navanti et al., 2024) about "The Second Machine Age" where digital capabilities are a new source of competitive advantage in the digital era.

Model Improvement Recommendations

Table 5. Model Improvement Recommendations

| Aspects | Findings | Recommendations | Priority |
|----------|---------------------|---|----------|
| Validity | SP4 loading = 0.422 | Remove or reformulate the SP4 indicator | Tall |

| | | | |
|------------------|--------------------------------|--|------|
| Reliability | HP and HRM marginal loading | Re-evaluation of constructs and indicators | Keep |
| Predictive Power | R ² CA = 74.3% | Maintain models for prediction | - |
| Model Fit | R ² HFSCM = 69.2% | The model is good for explanatory power | - |
| Significance | All hypotheses are significant | Valid and defensible theoretical models | - |

The evaluation of the overall research model indicates that it possesses excellent quality, as reflected in its high predictive power and strong explanatory capacity. The majority of constructs and indicators included in the model have met the required validity and reliability criteria, demonstrating that the model is both robust and methodologically sound.

Although the model performs well overall, minor refinements are still needed, particularly with regard to the SP4 indicator within the Supplier Partnership construct, which does not fully meet the convergent validity requirements. Despite this limitation, no substantial modifications to the model structure are necessary, as most indicators already function effectively in representing their respective constructs. With only small adjustments to the SP4 indicator, the model can be considered reliable and appropriate for supporting strategic decision making related to halal supply chain management and competitive advantage in MSMEs.

The outcomes of this study show that competitive advantage in halal food micro and small and medium enterprises (MSMEs) cannot be explained by individual practices of operation; instead, it is the result of the interaction of the supply-chain ties, human resource, and organisational readiness to institutionalise halal practices. Instead of being a compliance mechanism, halal food supply-chain management is an embodiment of a strategic capability, which educates risk management, product consistency, and communicates credibly to the market. The given interpretation aligns with the recent research, where halal value creation is viewed as a process-based, as opposed to a certification-based, phenomenon (Harsanto et al., 2024).

The high bargaining power of supplier alliance on competitive advantage exaggerates the structural importance of upstream relations to MSMEs. Suppliers ensure the protection of the halal integrity in the initial production levels with critical consideration and at the same time the quality and supply continuity are stabilised. The past literature shows that the uncertainty is reduced in collaborative supplier relationships, and the coordination is improved, notably in companies with limited resources (Mohamad et al., 2023). Besides the stability of operations, supplier collaborations also act as a source of knowledge transfer so that MSMEs can adapt materials and processes to the halal requirements and market demand (Sang et al., 2024). These forces explain why supplier alliance represents one of the main sources of competitive advantage.

Digital literacy also comes out as a critical factor of competitive advantage, as it has the ability of translating the principles of halal into operationally feasible and traceable practices. Digital capability allows MSMEs to computerise procurement documentation, organize coordination with suppliers, keep track of stock, and interact with consumers with increased transparency. The current findings assume that digital literacy enhances the competitiveness of MSMEs by counterbalancing structural limitations and increasing managerial responsiveness (Rahman et al., 2025). In the context of halal, digital competence strengthens supply-chain responsibility, which confirms previous results that digital transformation is more efficient and expands markets in case of sufficient managerial capabilities (Purnomo, 2024).

The positive correlation between halal food supply-chain management and competitive advantage is the basis of the growing agreement that halal integrity is an alternative source of differentiation. The study of halal value chains always focuses on the fact that the incorporation of the halal operation promotes efficiency, risk reduction, and information about the quality of governance to consumers and business associates (Sunarta, 2025; Harsanto et al., 2024). In this perspective, halal supply-chain management supplements competitiveness not via procedure encumbrances but operational discipline and reliability.

Human development comes out as the most pivotal influence that could shape the management of the halal food supply-chain whichever way, highlighting the critical issue of human agency in the maintenance of the halal integrity. Quotidian decision-making, procedural consciousness, and consistency, which are all dependent on human competence, determine compliance with Halal. The recent studies suggest that the problems of MSMEs with halal implementation are often related to a lack of operational knowledge, in lieu of ideological opposition (Mufatikhah, 2025). In the absence of appropriate training and capacity-building programs, certification can become a symbolic artefact instead of a meaningful product (Rahayu, 2023). Thus, the results justify the need to continue human growth as the pillar of successful practice of a halal supply chain.

The connection between halal supply-chain management and consumer trust and firm performance strengthens the competitive implications of this practice. Empirical studies reveal that halal certification strengthens consumer confidence and financial performance in case of being supported by clear communication and online interaction (Pradana & Elisa, 2025; Fachrurazi et al., 2023; Ahmad et al., 2025). However, price sensitivity remains a vital factor of concern which means that the halal based competitiveness would have to be balanced with the efforts of efficiency and value creation and cannot solely be based on the certification signals (Susiang et al., 2024; Auji et al., 2024; Rojak et al., 2025).

Lastly, the larger regulatory and technological environment increases the relevance of the current findings. The need of support mechanisms, which would strengthen human capacity and digital readiness, is supported by government activities which facilitate the implementation of a halal certification (Fathoni et al., 2024; Suganda et al., 2025; Rasyidah et al., 2025). At the same time, the use of emergent traceability technologies also focuses on the importance of collaboration, data management, and human preparedness as the key to future halal competitiveness (Rahman, 2025; Rahman & Ahmad, 2024; Zailani et al., 2024). Collectively, this research demonstrates that halal food supply-chain management is a competitive advantage source only when it becomes institutionalised as an organisational capability based on the people, partnerships, and digital competence.

Conclusion

This study shows that the implementation of Halal Food Supply Chain Management (HFSCM) has a strong and significant influence on the competitive advantage of culinary MSMEs fostered by Pekanbaru SOE Houses. All hypotheses are accepted, with Supplier Partnership being the most dominant factor in increasing competitive advantage, while Human Development is the main driver of the formation of HFSCM. The R^2 values of 74.3% for competitive advantage and 69.2% for HFSCM indicate that the model is able to explain variability in a strong way. These results confirm that supplier collaboration, digital literacy, product quality, and good use of technology and human resources are important elements in strengthening the competitiveness of MSMEs. Thus, the consistent implementation of HFSCM is a crucial strategy for MSMEs to improve quality, halal credibility, and competitive position in the culinary market.

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