

HALAL SUPPLY CHAIN MANAGEMENT: BALANCING EFFICIENCY, COMPLIANCE, AND SUSTAINABILITY

Riski Apriliani¹, Desy Arum Sunarta²

Pascasarjana IAIN Parepare¹, STAI DDI Pinrang²

Email: riskiapriliiani021@gmail.com ; desyarumdas@gmail.com

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Abstract

This article examines halal supply chain management from three key perspectives: operational efficiency, compliance with halal principles, and sustainability. In the context of the growing halal industry, the challenge of ensuring smooth product flows while maintaining sharia compliance and environmental sustainability is becoming increasingly critical. Operational efficiency is essential to maintain competitiveness, while adherence to halal principles is a non-negotiable foundation. On the other hand, sustainability in the halal supply chain demands attention to social and environmental aspects, which are gaining prominence among consumers and regulators. This article proposes an integrative approach to halal supply chain management that not only emphasizes cost and time efficiency but also ensures halal integrity and long-term sustainability. Through literature synthesis and conceptual analysis, the article offers strategic directions for the halal industry to develop a supply chain that is competitive, sharia-compliant, and sustainable.

Keywords:

Halal Supply Chain, Efficiency, Sharia Compliance, Sustainability, Strategic Management

Introduction

The demand for halal products has increased significantly over the past few decades, not only in Muslim-majority countries but also in global markets. This phenomenon reflects a growing consumer awareness regarding the halal status, safety, and sustainability of the products they consume. This rise has driven a transformation in supply chain management, where halal principles have become an integral part of companies' operational strategies, both for goods producers and service providers (Kurniawati & Cakravastia, 2023).

The halal supply chain does not merely focus on the certification of the final product but encompasses the entire process from upstream to downstream — starting from raw material procurement, processing, storage, distribution, to sales. This requires a stringent and standardized

operational management system to ensure that every stage complies with halal, thayyib (wholesome), and sharia principles (Abderahman et al., 2021). Companies aiming to compete in the global halal market need to understand this complexity, including the challenges of integrating halal systems into conventional operational practices.

However, in practice, many companies face gaps between theory and the implementation of the halal supply chain. Several studies indicate inconsistencies in applying halal principles, particularly in logistics and distribution. This issue is exacerbated by the limited understanding of supply chain actors regarding both international and local halal standards, which ultimately affects operational effectiveness and efficiency.

On the other hand, global pressures for sustainability require the halal supply chain to not only focus on religious compliance but also consider its environmental and social impacts. The holistic concept of halal inherently aligns with sustainability principles, encouraging ethical business practices that are environmentally friendly and socially responsible. Therefore, integrating sustainability values into the halal supply chain has become increasingly relevant for comprehensive examination.

Operational efficiency is also a critical element in the discourse on halal supply chain management. Companies need to ensure that adherence to halal principles does not lead to resource wastage or productivity decline. In this context, the main challenge lies in balancing sharia compliance with operational efficiency, so that halal products remain competitive in terms of cost and quality (Sarasi et al., 2025).

Previous research has discussed various models and approaches in halal operational management, yet there is still a lack of comprehensive literature synthesis regarding how efficiency, compliance, and sustainability aspects can be managed concurrently. Many studies tend to focus on one aspect without considering its interconnection with other aspects within the halal operation and supply chain system. Therefore, an integrative and systematic literature review is needed.

Furthermore, advancements in digital technologies such as the Internet of Things (IoT), blockchain, and artificial intelligence open new opportunities to enhance transparency and accountability in halal supply chain management. These innovations can be utilized to trace raw material origins, verify halal certification compliance, and optimize operational efficiency in real-time (Harsanto et al., 2024). However, adopting these technologies also faces structural and cultural challenges, especially among halal SMEs.

Thus, it is important to conduct a literature review that not only explores best practices in halal operations and supply chains but also identifies research gaps, implementation challenges, and strategic directions for developing efficient, compliant, and sustainable halal systems (Hanoum et al., 2023). This approach is expected to provide theoretical and practical contributions to management science development, particularly in the context of Islamic economics and global halal management (Sarasi et al., 2025).

This article aims to contribute to the academic discourse on halal operations and supply chain management through a critical review of relevant literature. The main focus of this study lies on three pillars: operational efficiency, compliance with halal principles, and system sustainability, with the hope of formulating more targeted research and policy directions in the future..

Literature Review

Operational Efficiency in the Halal Supply Chain

Efficiency in the halal supply chain has become a primary focus to ensure that halal principles do not hinder productivity and cost-effectiveness. The integration of information systems plays a crucial role in enhancing halal logistics efficiency, particularly in tracking raw materials and distributing final products (Kurniawati & Cakravastia, 2023). However, the lack of standardized processes among halal industry players across different regions poses a distinct challenge.

The implementation of Enterprise Resource Planning (ERP) systems and automation can reduce administrative costs and logistics processing time while maintaining transparency of halal processes throughout the supply chain (Abderahman et al., 2021). This demonstrates that operational efficiency depends not only on speed or cost but also on the system's capability to verify and document every halal stage in real time.

The Indonesian food industry has found that companies adopting technology-based halal operational systems experience efficiency improvements of up to 27% compared to those still using manual systems (Sarasi et al., 2025). This finding reinforces the argument that modernizing operational systems significantly contributes to the successful implementation of an efficient halal supply chain.

Furthermore, key success factors in halal supply chain management include government support, transportation planning, information technology, human resource management, collaborative relationships, halal certification, and halal traceability. These factors are considered crucial in ensuring efficiency and integrity within the halal supply chain.

Compliance with Halal Principles

Compliance with halal principles encompasses the entire process from upstream to downstream within the supply chain. Many studies have primarily focused on product certification, whereas halal compliance must cover the entire production process, transportation, and final service to consumers (Patil et al., 2020). A major challenge in ensuring consistent compliance is the lack of understanding and halal training among stakeholders in the supply chain.

Technologies such as blockchain can be utilized to record every stage of production and distribution in the halal supply chain, enabling the digital traceability of halal products to be assured and verified by authorities and consumers alike (Harsanto et al., 2024). The implementation of such technology can enhance transparency and accountability in halal supply chain management.

Understanding risks within the halal supply chain is essential to maintain integrity and compliance (Handayani et al., 2022). Researchers have identified five main research clusters related to the halal supply chain, including supply chain integration, halal lifestyle, and halal logistics. These studies emphasize the need for a holistic approach to understanding and managing risks that may affect halal compliance.

Sustainability in the Halal Supply Chain

Sustainability in the halal supply chain has become increasingly important in response to growing consumer awareness of environmental and social issues. Ideally, the halal supply chain

system should reflect the principles of *maqāṣid al-sharī'ah*, including the protection of life, property, and the environment. However, implementing sustainability within halal supply chains still faces challenges, particularly in waste management, energy efficiency, and workers' welfare.

Enhancing halal processes through the application of quality management systems, effective halal labeling, and technological adoption can improve the economic performance of the halal food supply chain (Ab Talib et al., 2015). Furthermore, sustainability efforts are strengthened by increasing trust and transparency, developing human resource competencies, and improving compliance with regulations.

By integrating sustainability principles into halal operational design, companies not only fulfill the demands of Muslim markets but also gain recognition in international trade frameworks that increasingly emphasize ESG (environmental, social, governance) aspects. Therefore, sustainability should be viewed as a strategic added value within the halal supply chain.

Research Methodology

This study employs a Systematic Literature Review (SLR) approach to evaluate and synthesize scholarly findings related to halal operations and supply chain management, with a particular focus on efficiency, compliance, and sustainability. This approach was chosen for its capacity to provide a comprehensive conceptual mapping of the development of halal supply chain discourse and practices over the past decade. The literature selected adheres to specific inclusion criteria: peer-reviewed journal articles published between 2015 and 2024, with high relevance to the research theme, and sourced from reputable journals indexed in Google Scholar, Scopus, or Sinta. Non-peer-reviewed documents and articles with purely theological orientations were excluded from this review.

To ensure validity and reliability, literature screening was conducted iteratively by two independent researchers using double coding and data triangulation across sources. External validity was strengthened by incorporating international and cross-regional journals, while internal validity was maintained through consistent thematic classification and replicability of synthesis results. Although this review does not include statistical meta-analysis due to the methodological diversity of the selected studies, it nonetheless provides a robust scientific foundation for understanding the strategic challenges and best practices in halal operations and supply chain management.

Results And Discussion

Efficiency in Halal Operations and Supply Chains

Efficiency in halal operations and supply chains is a critical issue widely discussed in the literature, as the complexity of halal systems imposes additional burdens on industry players. In this context, efficiency is not only measured by speed and cost, but also by the system's ability to maintain halal integrity without compromising logistical performance. Talib and Hamid note that halal logistics systems include additional components such as product segregation, regular audits, and certification processes, which increase operational burdens compared to conventional supply chains (Syazwan Ab Talib & Bakar Abdul Hamid, 2014). As a result, some industry players are reluctant to adopt fully halal-compliant systems, especially in countries where non-halal markets dominate.

In such conditions, the lean halal operation strategy becomes an important alternative to achieve efficiency. The lean principles originally developed in Japanese manufacturing are adapted to the halal context by identifying and eliminating non-value-added activities that do not violate sharia principles. For instance, packaging, storage, and distribution processes are reviewed to eliminate high-cost activities that do not add value. A study by Zailani et al. shows that the use of technology-based logistics information systems (such as RFID and halal-compliant ERP) can accelerate processes and reduce waste (Hamid et al., 2014). Companies that succeed in achieving operational efficiency in halal systems are generally those that integrate digital technologies throughout their entire halal value chain.

Furthermore, digitalization in halal supply chain management is a crucial factor in improving efficiency. The implementation of digital tracking systems such as blockchain allows businesses to verify the origin and certification process of halal products in real-time, thus reducing the risk of delays and violations. Research by Zulfakar et al. emphasizes that digital traceability not only improves time and logistics efficiency but also strengthens consumer trust in halal claims (Zulfakar et al., 2014). This is particularly important in the context of international trade, where shipping speed and transparency are key factors.

However, this efficiency is not evenly distributed across regions. In developing countries, structural barriers such as inadequate halal logistics infrastructure, low information technology penetration, and limited human resources with halal expertise pose serious challenges. Khan et al. report that many companies in South Asia and parts of Southeast Asia still face difficulties in accessing fast and reliable halal certification facilities. These issues slow down distribution processes and increase logistics costs, ultimately reducing overall operational efficiency. Therefore, public policy intervention is needed to support the development of a national halal ecosystem.

In addition, collaboration between the public and private sectors is essential for improving halal supply chain efficiency in a sustainable manner. Governments can support the development of logistics infrastructure, establish integrated halal certification centers, and provide technological incentives to encourage digitalization. Meanwhile, the private sector is expected to continue innovating in halal logistics technology and developing business models based on sharia-compliant efficiency. Recent research highlights the importance of a strategic approach that combines religious values, economic efficiency, and competitive advantage in the global halal market. Thus, efficiency in halal supply chains is not only an operational necessity but also a sustainable business strategy.

Compliance with Halal Principles

Compliance with halal principles is a fundamental aspect of operations and supply chains within the halal system. This compliance extends beyond fulfilling administrative requirements for certification; it also involves the active participation of all stakeholders along the value chain to preserve halal integrity. According to Tieman, halal principles must be applied comprehensively, from upstream to downstream, covering raw materials, production processes, storage, distribution, and even presentation to the end consumer (Tieman, 2015). If any segment of the supply chain fails to uphold halal standards, the entire process may be deemed invalid under Islamic law.

One of the main challenges in maintaining compliance is the variation in halal certification standards and systems across different countries. Khan et al. explain that although most Muslim-

majority countries have halal certification bodies, there are significant differences in procedures, scope of testing, and mutual recognition among these institutions. This inconsistency hampers implementation and creates obstacles for cross-border trade. For example, a halal certificate issued in one country may not be recognized in another, even if issued by a reputable organization. Therefore, the harmonization of international halal standards has become a global urgency to ensure uniform and widely accepted compliance.

Furthermore, compliance within the halal supply chain heavily depends on the understanding and awareness of logistics personnel regarding sharia principles. A study by Tieman and Ghazali found that low awareness at the operational level—such as among truck drivers, warehouse workers, and logistics staff—often becomes a weak point in maintaining halal integrity (Tieman & Che Ghazali, 2013). In many cases, violations occur not out of ill intent, but due to insufficient training and a lack of understanding regarding the importance of halal procedures such as segregation, cleansing, and labeling. Thus, halal training and education are integral components of a comprehensive halal compliance management system.

In addition to human resources, documentation systems and internal audits also play a crucial role in ensuring compliance. Companies with strong reporting and tracking systems are more capable of quickly and accurately identifying and addressing potential violations. Research by Zulfakar et al. indicates that the integration of certification systems, digital tracking, and employee training has significantly improved levels of halal compliance (Zulfakar et al., 2014). In fact, companies that successfully implement a holistic halal assurance system tend to be more trusted by consumers and international business partners.

Ultimately, compliance with halal principles is not only an expression of religious adherence, but also a strategic approach to reputation management and risk mitigation in modern business. Consumer trust in the halal integrity of products represents a distinct competitive advantage, particularly in the global market, which increasingly demands product transparency and integrity. Research by Yusof et al. shows that high levels of halal compliance are positively correlated with customer loyalty and the long-term performance of halal companies. Therefore, investment in compliance systems fulfills not only religious obligations but also supports overall business sustainability.

Sustainability in the Halal Supply Chain

Sustainability within the halal supply chain has emerged as a strategic agenda of increasing importance amidst global market demands and environmental sustainability concerns. A halal system that solely emphasizes compliance with Islamic legal principles is no longer considered sufficient without addressing the social and ecological impacts of supply chain activities. Within this framework, sustainability encompasses three core dimensions—economic, social, and environmental—commonly referred to as the *triple bottom line*. Halal enterprises that integrate sustainability principles into their operations not only enhance efficiency but also strengthen their competitive advantage in the global marketplace.

From an environmental perspective, eco-friendly practices such as waste reduction, energy efficiency, and the use of recyclable packaging materials are increasingly being adopted in halal supply chains. This approach aims not only to reduce carbon footprints but also aligns with Islamic values concerning environmental stewardship (*hifz al-bi'ah*). Halal companies implementing sustainable logistics systems tend to enjoy stronger brand image and higher consumer loyalty. This

is particularly significant as Muslim consumers are becoming more aware of the importance of products that are not only *halal* in a jurisprudential sense but also *thayyib*—wholesome and ethically produced in all stages of the supply chain.

On the social dimension, sustainability in the halal supply chain touches on justice and the welfare of micro, small, and medium enterprises (MSMEs). Many halal supply chains rely on MSMEs for sourcing raw materials or distribution partnerships, making empowerment and fair collaboration central to social sustainability. According to Kamarulzaman and Md Isa, large companies engaged in halal systems must ensure the provision of training, market access, and equitable profit-sharing to foster a fair and inclusive halal ecosystem. This approach is in line with the objectives of Islamic law (*maqasid al-shariah*), which prioritize the protection of life and the well-being of humanity.

Economic sustainability in the halal supply chain can be achieved through long-term cost efficiency, halal product innovation, and the strengthening of community-based logistics networks. This approach enables companies to go beyond certification schemes by building added value through a strong and far-reaching halal narrative. Tieman emphasizes that halal companies which successfully embed sustainability narratives into their products are more likely to be accepted in non-Muslim markets, as they convey universal messages of ethics and social responsibility. Thus, economic sustainability is not merely about profit generation, but about creating shariah-based value.

Finally, the integration of sustainability into halal management systems requires a strategic and collaborative approach involving government, private sector, academia, and civil society. Governments play a key role in creating regulatory frameworks that encourage sustainable practices, while academics provide evidence-based research to inform policy decisions. Zailani et al. conclude that cross-sectoral collaboration will lead to a halal supply chain that not only complies with Islamic principles but is also capable of responding to global challenges such as climate change, economic inequality, and food insecurity. Therefore, sustainability should not be viewed as a complementary component, but rather as a fundamental pillar of the future of the halal industry.

Conclusion And Recommendation

This literature review affirms that halal operations and supply chains are pivotal components in supporting a sustainable Islamic economic system. Three interrelated aspects—efficiency, compliance, and sustainability—serve as critical benchmarks for the successful implementation of halal supply chains. Operational efficiency provides the foundation for optimizing logistics and distribution processes, which not only reduce costs but also ensure speed and accuracy—key requirements in the global halal business ecosystem.

Meanwhile, halal compliance demands a high level of integrity from all supply chain actors, from producers to distributors, in adherence to certified shariah principles. This compliance is not merely a moral and spiritual obligation, but also a key factor in building consumer trust and corporate credibility. In this context, consistently maintaining halal compliance becomes a fundamental prerequisite for developing a trustworthy and inclusive halal value chain.

Furthermore, sustainability has emerged as a strategic issue in the development of current and future halal supply chains. The integration of sustainability principles—environmental, social, and economic—will reinforce the position of the halal industry as an economic system that is not only

legally valid under Islamic law but also relevant to global demands for ethical and responsible business practices. Multi-stakeholder collaboration among industry, government, and academia is essential in formulating policies, standards, and monitoring systems that promote efficient, compliant, and sustainable halal practices.

This literature-based approach concludes that halal operations and supply chains cannot be viewed solely as technical systems; rather, they must be integrated into a comprehensive strategic management paradigm. Future research should focus on the empirical testing of successful halal supply chain models and the development of measurable sustainability indicators grounded in *maqasid al-shariah* that can be widely adopted across various sectors of the halal industry. In doing so, the halal system can not only meet the needs of the Muslim community but also offer a global solution for more equitable and dignified trade and consumption systems.

Recommendation

Based on the findings of this literature review, several strategic recommendations are proposed to enhance the effectiveness and resilience of halal operations and supply chains. These recommendations are directed toward key stakeholders, including policymakers, industry leaders, certification bodies, and academic researchers.

First, there is an urgent need for the harmonization of halal standards at the global level to ensure compliance and operational efficiency across borders. Governments and both national and international halal certification bodies are encouraged to collaborate in developing a unified and mutually recognized certification framework. Such harmonization is essential to reduce trade barriers for halal products between countries and to guarantee the quality and integrity of halal goods throughout the supply chain.

Second, the halal industry should adopt advanced information technologies in managing halal supply chains, including blockchain, the Internet of Things (IoT), and cloud-based digital tracking systems. These technologies can facilitate real-time traceability, enhance transparency, and prevent cross-contamination that could compromise a product's halal status. Digitalizing the supply chain will also improve overall efficiency and responsiveness to changing market demands.

Third, halal businesses are advised to strengthen the integration of sustainability principles into their management systems. Beyond mere compliance with Islamic legal rulings (*fiqh*), firms must also address environmental concerns, social welfare, and long-term economic sustainability. Such practices not only serve as competitive advantages but also represent the practical realization of the concept of *halalan thayyiban* in today's context.

Fourth, capacity building of human resources in halal logistics and management must be prioritized. Comprehensive training and halal certification for workers at all levels of the production and distribution chains should be enhanced to ensure uniform understanding and awareness of halal principles. A workforce that is halal-aware is a critical pillar for maintaining the integrity of the entire system.

Fifth, academics and researchers in Islamic economics and management are encouraged to undertake further empirical studies to test the effectiveness of halal supply chain models that are efficient, compliant, and sustainable. These studies can inform the development of adaptive public policies and industry standards that remain faithful to core shariah principles while addressing the demands of a rapidly evolving global market.

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