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Barriers and Drivers of Halal Supply Chain Integration: A Qualitative Analysis of Existing Literature

Andri Mulyana[1], Ahmad Maulidizen[2], Fajar Azhari Julian[3*]
[2] Department of Management. Universitas Ary Ginanjar. Indonesia
[13] Department of Industrial Engineering. Universitas Ary Ginanjar, Indonesia

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ABSTRACT

This study aims to explore the barriers and drivers of halal supply chain integration by conducting a qualitative analysis of existing literature. Employing a library research method, the study synthesizes findings from academic publications, reports, and case studies to identify key factors influencing the adoption and implementation of halal supply chain practices. The analysis reveals that barriers such as lack of standardization, high operational costs, and insufficient stakeholder awareness hinder integration, while drivers like increasing consumer demand for halal products, regulatory support, and technological advancements facilitate its growth. The findings highlight the need for collaborative efforts among industry stakeholders to address the identified challenges and enhance halal supply chain efficiency. This research provides valuable insights for policymakers, businesses, and researchers to foster the development of a robust halal supply chain ecosystem.

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* *Corresponding author: fajar.azhari@uag.ac.id*

INTRODUCTION

The global demand for halal products has grown exponentially over the past decade, driven by the increasing Muslim population and heightened consumer awareness of halal principles. Halal supply chain integration ensures that products comply with Islamic laws throughout the entire supply chain process, from sourcing to delivery (**Mawardi et al., 2025**). This compliance not only guarantees the integrity of halal products but also fosters trust among

consumers. However, achieving seamless integration of halal supply chains remains a significant challenge for businesses operating in diverse markets (**Dwivedi, 2015**).

Existing research highlights several barriers to halal supply chain integration, such as inconsistent halal certification standards, inadequate infrastructure, limited knowledge among supply chain stakeholders, and high operational costs. These barriers often hinder businesses from fully adopting halal supply chain practices, creating inefficiencies and risking consumer trust. Moreover, the lack of harmonized standards across regions poses a significant obstacle, as it complicates cross-border trade and increases compliance costs for businesses operating internationally (**Johari et al., 2024**).

Despite these challenges, the halal market's rapid expansion and technological advancements present significant opportunities to overcome these obstacles. The growing consumer demand for halal products and services, supported by advancements in blockchain technology, IoT, and logistics innovation, has created a conducive environment for enhancing halal supply chain integration. These technological drivers have the potential to streamline processes, improve traceability, and ensure compliance with halal standards across the supply chain (**Quang et al., 2016**). Nevertheless, a comprehensive understanding of the factors hindering and driving halal supply chain integration remains underexplored. Most existing studies focus on specific aspects of halal logistics or individual case studies, resulting in a fragmented view of the challenges and opportunities. This gap in the literature underscores the need for a holistic investigation that synthesizes existing knowledge and identifies actionable insights to support industry stakeholders.

The urgency of this research lies in the strategic importance of the halal supply chain for businesses aiming to cater to the growing Muslim consumer market. As the halal industry expands, so does the expectation for businesses to adhere to ethical, sustainable, and sharia-compliant practices. Failure to address these expectations could result in reputational damage and a loss of market share. Furthermore, governments and organizations striving to position themselves as global leaders in halal trade must overcome the barriers to halal supply chain integration to remain competitive (**Ali et al., 2021**). Addressing these issues is also critical for fostering consumer trust and ensuring the authenticity of halal products. The integration of halal supply chains is not merely about compliance with Islamic laws but also about aligning with broader consumer trends, such as the demand for transparency, sustainability, and ethical practices in the production and distribution of goods. By tackling these challenges, the halal supply chain can serve as a benchmark for ethical and sustainable supply chain management worldwide (**Chuang & Chen, 2023**).

This study aims to analyze the barriers and drivers of halal supply chain integration by synthesizing insights from existing literature. Through a qualitative library research approach, this study systematically reviews academic publications, reports, and case studies to identify the key factors influencing halal supply chain integration. This approach allows for a comprehensive understanding of the challenges and opportunities present within the industry. The findings are expected to reveal critical barriers such as regulatory fragmentation, lack of stakeholder awareness, and high costs, as well as key drivers like technological innovation, consumer demand, and government support. By highlighting these factors, the study seeks to provide actionable recommendations for businesses and policymakers to enhance halal supply chain practices (**Ardiantono et al., 2024**).

The implications of this research are far-reaching. For policymakers, the study offers insights into designing policies and regulations that support seamless halal supply chain integration. For businesses, it provides a roadmap for overcoming challenges and leveraging

opportunities to achieve competitive advantage. For researchers, the findings open avenues for further exploration into specific aspects of halal logistics and supply chain management. This research addresses a critical gap in the existing literature by offering a comprehensive analysis of the barriers and drivers of halal supply chain integration. The study's findings will contribute to academic discourse and provide practical insights to foster an efficient, robust, and sustainable halal supply chain ecosystem (**Ardiantono et al., 2024**).

RESEARCH METHOD

This study employs a qualitative library research approach to explore the barriers and drivers of halal supply chain integration. Library research is particularly suited for this study as it allows for an in-depth analysis of existing literature, including academic articles, reports, and case studies, to synthesize insights and identify recurring themes. The primary method of data collection involves a systematic review of relevant academic publications, industry reports, conference proceedings, and case studies. Sources were identified through databases such as Scopus, Web of Science, and Google Scholar, using keywords like halal supply chain integration, barriers in halal logistics, and drivers of halal supply chain. The selection criteria focused on studies published in peer-reviewed journals, reports from credible industry organizations, and case studies that provide practical insights into halal supply chain practices (**Ardiantono et al., 2024**).

The data analysis process involves thematic analysis to identify key patterns, barriers, and drivers emerging from the reviewed literature. Thematic coding was used to categorize the data into predefined themes such as regulatory challenges, technological enablers, consumer demand, and stakeholder engagement. By analyzing these themes, the study aims to provide a comprehensive understanding of the factors influencing halal supply chain integration (**Molinillo et al., 2020**). The analysis was conducted iteratively, allowing for the refinement of themes and insights as new data were reviewed. This approach ensures that the findings are robust and reflective of the current state of knowledge in the field. By adopting this methodology, the study ensures a rigorous and systematic approach to understanding the barriers and drivers of halal supply chain integration, providing valuable insights for policymakers, businesses, and researchers (**Ardiantono et al., 2024**).

RESULTS AND DISCUSSION

Barriers to Halal Supply Chain Integration

The integration of halal supply chains faces several significant barriers that impede its seamless implementation. One of the primary challenges is the inconsistency in halal certification standards across different regions and countries. This inconsistency not only complicates the certification process but also increases operational and compliance costs for businesses engaged in cross-border trade. Companies often need to navigate multiple certification bodies, each with its own set of requirements, leading to inefficiencies and delays in the supply chain (**Ali et al., 2024**).

The lack of infrastructure to support halal supply chain operations further exacerbates the situation. For instance, the absence of dedicated halal transportation and storage facilities often results in the contamination of halal products with non-halal items, thereby compromising their integrity. Additionally, inadequate cold chain systems, especially in developing countries, hinder the safe handling and preservation of perishable halal goods, posing significant risks to product quality and consumer trust. High operational costs

represent another significant obstacle to achieving effective halal supply chain integration (**Mas'udah et al., 2022**). Implementing halal-compliant processes requires substantial investment in specialized equipment, training programs for staff, and certification fees. These costs can be particularly prohibitive for small and medium-sized enterprises (SMEs), limiting their ability to compete in the halal market. Consequently, many businesses may opt to bypass halal compliance altogether, undermining the overall growth and credibility of the halal industry.

A further challenge is the lack of awareness and knowledge among key stakeholders, including producers, distributors, and consumers. Many supply chain actors have limited understanding of the principles and requirements of halal supply chain management. This knowledge gap often leads to unintentional non-compliance with halal standards. On the consumer side, insufficient awareness about the importance of halal integrity throughout the supply chain weakens demand for rigorous halal practices, reducing the pressure on businesses to maintain high standards. The absence of a harmonized regulatory framework also hinders the effective integration of halal supply chains. While some countries have established robust halal governance systems, others lack clear guidelines or enforcement mechanisms. This disparity creates an uneven playing field for businesses and diminishes consumer trust in the authenticity of halal products. Harmonizing regulations at a global level is essential to address this issue and facilitate smoother international trade.

Cultural and logistical challenges also add complexity to halal supply chain integration. Differences in language, business practices, and regional trade restrictions often lead to miscommunication and misunderstandings among stakeholders. These challenges not only slow down the adoption of halal supply chain practices but also increase the likelihood of errors and non-compliance. The dynamic nature of global supply chains introduces additional challenges, such as the need to adapt to varying market demands and respond to disruptions. The halal supply chain is particularly vulnerable to disruptions due to its stringent compliance requirements. For example, delays in certification or inspection processes can lead to significant setbacks, affecting the timely delivery of goods to consumers (**Aziz et al., 2021**).

Limited technological adoption in certain regions further hinders the integration of halal supply chains. While advanced technologies such as blockchain and IoT have been proven to enhance traceability and compliance, their implementation remains uneven across countries. Developing nations often lack the necessary infrastructure and expertise to adopt these technologies, creating disparities in the efficiency and reliability of halal supply chains. Stakeholder engagement is another critical issue affecting halal supply chain integration. The lack of effective collaboration between governments, certification bodies, and industry players undermines efforts to standardize practices and improve transparency. Without coordinated efforts, the fragmentation of responsibilities and conflicting interests among stakeholders can stall progress toward achieving a seamless halal supply chain (**Ali et al., 2024**).

To address these barriers, a concerted effort is required from all stakeholders involved in the halal supply chain. Governments must take the lead in harmonizing regulations and investing in infrastructure, while businesses should prioritize capacity building and technological adoption. Consumer awareness campaigns can also play a pivotal role in driving demand for stringent halal practices, ensuring that the entire supply chain operates with integrity and efficiency.

Drivers of Halal Supply Chain Integration

The integration of halal supply chains has become a cornerstone of the global halal industry, driven by a multitude of factors that ensure compliance with Islamic principles while meeting the demands of an expanding market. As the global Muslim population continues to grow, so does the demand for halal products that adhere to strict religious guidelines. This demand is not confined to food and beverages but extends to pharmaceuticals, cosmetics, fashion, and even services like halal tourism and logistics. Companies striving to serve this burgeoning market recognize the need for seamless supply chain integration to meet consumer expectations and build trust (**Hew et al., 2020**).

Consumer awareness and preferences have evolved, with halal-conscious buyers demanding transparency and assurance regarding the products they consume. The perception of halal products as not only religiously compliant but also ethically and hygienically superior has broadened their appeal to non-Muslim consumers as well. This growing market diversity has pushed businesses to adopt supply chain practices that ensure the integrity of halal products from production to consumption, fostering consumer confidence across cultural and religious boundaries (**Maulidizen, 2020**).

Regulatory support from governments plays a critical role in driving halal supply chain integration. In countries with substantial Muslim populations, such as Malaysia and Indonesia, governments have implemented comprehensive halal certification frameworks that set clear standards for businesses. These regulations provide a structured approach, making it easier for companies to align their practices with halal requirements. Furthermore, many non-Muslim-majority countries have also recognized the potential of the halal market and introduced policies to facilitate halal trade, enabling global businesses to cater to Muslim consumers effectively (**Suparpto et al., 2017**).

Technological advancements have become a powerful enabler of halal supply chain integration, addressing challenges of traceability and compliance. Blockchain technology, for instance, ensures transparency by providing immutable records of a product's journey through the supply chain. This level of traceability allows consumers to verify the halal status of products in real time, enhancing trust and accountability. Meanwhile, Internet of Things (IoT) devices monitor production conditions to ensure compliance with halal standards, while artificial intelligence optimizes supply chain processes, reducing inefficiencies and ensuring strict adherence to Islamic principles (**Maulidizen et al., 2022b**).

The globalization of the halal industry has further emphasized the need for robust supply chain integration. Countries like Brazil and Thailand have emerged as major exporters of halal goods, serving markets in the Middle East, Southeast Asia, and beyond. This global reach necessitates the harmonization of halal certification standards and practices to ensure consistency and reliability across borders. Businesses that successfully integrate their supply chains to meet international halal requirements position themselves as leaders in this competitive market. Trust remains at the heart of the halal supply chain. Modern consumers expect not only compliance but also transparency regarding the origins and handling of halal products. Companies that leverage digital tools, such as QR codes linked to detailed certification data, empower consumers to make informed choices. This emphasis on transparency not only strengthens consumer loyalty but also differentiates businesses in an increasingly competitive marketplace (**Suyanto, 2023**).

Collaboration among stakeholders is another key driver of halal supply chain integration. Governments, certification bodies, industry players, and consumers each play a vital role in ensuring the smooth operation of halal supply chains. Certification authorities

such as Malaysia's JAKIM and Indonesia's MUI provide the regulatory frameworks and expertise necessary for businesses to maintain compliance. At the same time, industry players invest in infrastructure and technology, while consumers actively demand adherence to halal standards, creating a cycle of accountability and progress (**Maulidizen et al., 2022a**). The competitive nature of the halal market has also spurred innovation in supply chain management. Businesses are under pressure to adopt practices that demonstrate full compliance with halal standards, as this transparency often becomes a deciding factor for consumers. Companies that fail to integrate their supply chains risk losing market share to competitors who prioritize halal integrity, making integration an essential strategy for survival and growth (**Suparpto et al., 2017**).

Support from Islamic financial institutions has further bolstered halal supply chain integration. By providing sharia-compliant financing options, these institutions enable businesses to invest in the necessary infrastructure and technology for halal compliance. This financial backing not only reduces barriers to entry but also incentivizes companies to adopt practices that align with Islamic principles, further strengthening the integrity of the halal ecosystem. The role of academic research and innovation cannot be overlooked. Universities and research institutions worldwide are contributing to the advancement of halal supply chain practices by identifying challenges and proposing solutions. These efforts have led to the development of new technologies and strategies that enhance the efficiency and sustainability of halal supply chains. The insights gained from such research ensure that the halal industry continues to evolve in response to changing consumer needs and market dynamics.

In essence, the integration of halal supply chains is a dynamic process driven by growing consumer demand, regulatory frameworks, technological innovation, and collaborative efforts. As the halal industry expands globally, the emphasis on transparency, traceability, and compliance will continue to shape its trajectory, ensuring that halal products meet the highest standards of integrity and quality (**Annisaputri et al., 2020**).

The Impact of Technological Innovations on Halal Supply Chains

Technological innovations have profoundly transformed halal supply chains, addressing longstanding challenges and paving the way for greater efficiency, transparency, and compliance with Islamic principles. These advancements, particularly in blockchain, the Internet of Things (IoT), and logistics, have redefined how halal products are produced, monitored, and delivered, ensuring the integrity of the supply chain from end to end. With the halal market's expansion and increasing consumer demand for transparency, technology has become a cornerstone in maintaining trust and safeguarding the authenticity of halal goods (**Sokolova et al., 2019**).

Blockchain technology stands out as a game changer in halal supply chain management, offering unparalleled traceability. By creating a decentralized and immutable ledger, blockchain ensures that every step in the production and distribution process is recorded transparently. This capability allows consumers and certification bodies to verify the halal status of products in real time, mitigating concerns over fraud or mislabeling. For instance, blockchain can track whether animals were slaughtered in compliance with halal requirements or whether cross-contamination occurred during processing, thereby bolstering consumer confidence (**Javaid et al., 2022**).

The Internet of Things (IoT) complements blockchain by providing real-time monitoring of supply chain conditions. IoT devices, such as sensors and smart tags, enable businesses to

track critical parameters like temperature, humidity, and handling practices. These technologies are especially vital for perishable halal goods, such as meat and dairy products, where maintaining specific conditions is essential to preserving both quality and compliance (**Annisaputri et al., 2020**). IoT not only ensures adherence to halal standards but also minimizes waste, making supply chains more sustainable and cost-effective.

Logistics innovations have further enhanced the efficiency of halal supply chains, particularly in the transportation and storage of goods. Advances in cold chain logistics, for example, have made it possible to deliver halal-certified perishable products to distant markets without compromising their quality. Additionally, digital logistics platforms have streamlined inventory management, reducing delays and ensuring that halal products reach consumers promptly (**Hatta et al., 2018**). These innovations address the logistical complexities of the halal industry, especially as it becomes increasingly globalized. The integration of these technologies has also enabled businesses to respond more effectively to regulatory requirements. Halal certification bodies demand strict adherence to Islamic principles at every stage of the supply chain, and technology provides the tools needed to meet these standards. Automated systems can ensure that production processes align with halal guidelines, while digital records simplify audits and inspections by certification authorities. This alignment reduces the administrative burden on businesses while ensuring full compliance with halal regulations (**Aslam et al., 2020**).

Moreover, technological advancements have strengthened consumer trust, a critical factor in the halal market. By leveraging tools such as QR codes linked to blockchain data, companies can provide consumers with detailed information about the origins and handling of their products. This level of transparency not only enhances consumer confidence but also positions businesses as leaders in a competitive marketplace. For Muslim and non-Muslim consumers alike, the assurance of quality and authenticity has become a key determinant in purchasing decisions (**Sattler, 2011**). The adoption of technology has also driven innovation within the halal industry itself. Companies are now exploring advanced solutions, such as artificial intelligence (AI) for predictive analytics and machine learning for process optimization, to further enhance supply chain performance. AI can predict potential disruptions and suggest preventive measures, ensuring the smooth operation of halal supply chains. These technologies not only improve efficiency but also reduce costs, making halal products more accessible to consumers worldwide.

Collaboration between stakeholders has been instrumental in the successful integration of technological innovations. Governments, certification bodies, and private companies have worked together to develop standardized frameworks that facilitate the adoption of these technologies. For instance, governments in countries like Malaysia and the UAE have launched initiatives to encourage blockchain use in halal certification, setting benchmarks for global best practices. Such partnerships ensure that technology adoption benefits all stakeholders, from producers to consumers. Despite these advancements, challenges remain in fully integrating technology into halal supply chains. Issues such as high implementation costs, the digital divide, and resistance to change among traditional businesses can hinder progress (**Fakhruroji, 2019**). However, as technology becomes more accessible and its benefits more widely recognized, these barriers are gradually being overcome. Investment in training and capacity building will be crucial to ensuring that all industry players can leverage technological tools effectively.

The impact of technological innovations extends beyond operational efficiency, fostering the growth of a global halal economy. By addressing concerns of authenticity and

compliance, technology has enabled halal products to penetrate non-Muslim-majority markets, creating new opportunities for trade and collaboration. Furthermore, the emphasis on transparency and sustainability aligns with broader consumer trends, positioning halal supply chains as models of ethical and responsible business practices. The integration of blockchain, IoT, and logistics innovations has revolutionized halal supply chains, ensuring greater traceability, efficiency, and adherence to halal principles. These technologies not only address the unique challenges of the halal industry but also position it as a leader in transparency and ethical practices. As the halal market continues to expand globally, technological advancements will remain pivotal in shaping its future, meeting the needs of a diverse and increasingly discerning consumer base.

Stakeholder Collaboration and Engagement

The development of a robust and reliable halal supply chain ecosystem hinges on effective collaboration and engagement among key stakeholders. These stakeholders—governments, certification bodies, producers, distributors, and consumers—each play a critical role in ensuring that halal products adhere to Islamic principles while meeting market demands. Their synergy creates a unified framework that fosters trust, transparency, and sustainability in the halal industry, which has become increasingly globalized and competitive **(Mundaca & Wamsler, 2025**).

Governments serve as pivotal actors in the halal supply chain by providing regulatory frameworks and policy support. Their role involves setting national halal standards, enforcing compliance, and fostering an environment conducive to the growth of the halal industry. Governments in countries like Malaysia, Indonesia, and the UAE have introduced comprehensive halal policies that include certification requirements, tax incentives, and export promotion. These measures ensure that local producers can compete internationally while maintaining the integrity of their halal certification systems. Certification bodies are equally crucial, acting as gatekeepers of halal authenticity. Their primary responsibility is to verify that products and processes align with Islamic guidelines. These bodies, whether government-affiliated or independent, ensure consistency in certification standards, which is vital for consumer trust. Collaborative efforts between certification bodies across different countries have also facilitated mutual recognition agreements, enabling halal-certified products to gain access to multiple markets without undergoing redundant certification processes (**Hollebeek et al., 2023**).

Producers and manufacturers play a frontline role in ensuring the integrity of halal products. Their adherence to halal standards at every stage of production—from sourcing raw materials to processing and packaging—is critical to maintaining the trust of consumers and certification bodies. Collaboration with other stakeholders, such as government agencies and technology providers, enables producers to implement best practices and ensure compliance. Many producers have adopted advanced systems like blockchain and IoT to enhance traceability and simplify the auditing process, further strengthening their relationships with stakeholders (**Kolasani, 2024**).

Distributors and logistics providers are the linchpins of the halal supply chain, tasked with ensuring that halal products maintain their integrity during transportation and storage. This requires strict compliance with halal handling procedures, particularly for perishable goods like meat and dairy. Collaboration with producers and certification bodies helps distributors align their operations with halal requirements. Additionally, partnerships with technology providers have allowed logistics companies to implement innovations such as

cold chain systems and real-time monitoring, ensuring that products reach consumers in optimal condition (**Leckie et al., 2016**).

Consumers, while often seen as the endpoint of the supply chain, are active participants in the halal ecosystem. Their demand for transparency, authenticity, and quality drives improvements across the entire supply chain. Educated and aware consumers advocate for stricter certification processes and encourage businesses to adopt ethical and sustainable practices. Moreover, consumer feedback helps producers and certification bodies identify areas for improvement, fostering continuous innovation and accountability (**Ferreira et al., 2020**).

The importance of collaboration among these stakeholders becomes even more evident in addressing challenges unique to the halal industry. Issues such as cross-contamination, fraudulent labeling, and inconsistencies in certification standards can only be resolved through collective action. Stakeholder engagement forums, trade shows, and intergovernmental dialogues have proven effective in fostering communication and resolving disputes. These platforms encourage stakeholders to share insights, align expectations, and develop unified strategies to address industry challenges.

Technology has also emerged as a key enabler of stakeholder collaboration, providing tools for seamless communication and data sharing. For instance, digital platforms connecting producers, distributors, and certification bodies streamline the certification and auditing process, reducing delays and errors. Blockchain technology ensures that all stakeholders have access to a transparent and immutable record of the supply chain, fostering trust and accountability. These technological solutions not only enhance operational efficiency but also strengthen relationships among stakeholders (**Calder et al., 2009**).

The global nature of the halal market underscores the need for international collaboration. Countries with significant Muslim populations often collaborate with non-Muslim-majority nations to facilitate the export and import of halal products. Governments and certification bodies work together to harmonize standards, while multinational corporations partner with local businesses to expand their market reach. This international cooperation has contributed to the growth of a global halal economy, benefiting stakeholders across borders(**Cheng et al., 2023**).

However, achieving effective stakeholder collaboration is not without challenges. Differences in cultural, legal, and economic contexts can create barriers to alignment and mutual understanding. For instance, varying interpretations of halal standards may complicate international trade agreements. Overcoming these challenges requires ongoing dialogue, capacity building, and the establishment of universally accepted guidelines. Organizations such as the Organization of Islamic Cooperation (OIC) play a vital role in fostering consensus and promoting best practices.

Stakeholder collaboration and engagement are essential for building a robust halal supply chain ecosystem. Governments, certification bodies, producers, distributors, and consumers each contribute unique perspectives and expertise, creating a holistic framework that ensures compliance, quality, and trust. As the halal industry continues to grow and evolve, sustained collaboration among these stakeholders will remain crucial in addressing challenges and capitalizing on opportunities in an increasingly interconnected global market (**Fernandes & Esteves, 2016**).

Policy and Strategic Recommendations

Policy and strategic recommendations are essential for overcoming barriers and optimizing the potential of halal supply chains in an increasingly globalized world. As the halal industry expands beyond traditional markets, it faces challenges such as inconsistent standards, limited cross-border cooperation, and logistical inefficiencies. To address these issues, a comprehensive set of actionable insights is required, aimed at creating a unified, efficient, and sustainable halal supply chain ecosystem.

One of the most critical policy recommendations is the harmonization of halal standards globally. Currently, variations in certification criteria and processes across countries create significant obstacles for producers and exporters. These inconsistencies not only increase compliance costs but also complicate international trade. Establishing universally accepted halal standards would provide clarity and consistency, enabling smoother trade flows and greater consumer confidence(**Brodie et al., 2013**). Organizations like the Organization of Islamic Cooperation (OIC) and regional bodies can play a pivotal role in facilitating dialogue and consensus among member states to achieve this harmonization.

Cross-border cooperation is another strategic priority for optimizing halal supply chains. Collaboration between governments, certification bodies, and industry stakeholders can help address regulatory and logistical challenges. Bilateral and multilateral agreements aimed at mutual recognition of halal certifications would streamline trade and reduce redundant processes. For instance, partnerships between Southeast Asian nations and the Middle East could enhance market access for halal products, leveraging the strengths and resources of both regions. Such cooperation also fosters innovation and knowledge sharing, further strengthening the global halal ecosystem.

Investing in infrastructure and technology is another key recommendation for enhancing halal supply chains. Governments and private sector stakeholders should prioritize the development of specialized halal logistics infrastructure, such as dedicated cold chain facilities and halal-certified transportation systems. Advanced technologies like blockchain and IoT should also be integrated into supply chain operations to improve traceability, ensure compliance, and reduce inefficiencies. Policy incentives, such as tax breaks or subsidies for technology adoption, can encourage businesses to invest in these transformative solutions (**Maulidizen, 2024**).

Human capital development is equally important in ensuring the sustainability and effectiveness of halal supply chains. Policies should focus on training and certifying professionals in halal compliance, logistics, and quality assurance. Educational institutions and industry players can collaborate to develop specialized curricula and certification programs that align with global halal standards. By building a skilled workforce, the halal industry can maintain high levels of quality and trust while fostering innovation and adaptability.

Supporting small and medium enterprises (SMEs) is another strategic imperative. SMEs play a significant role in the halal industry, particularly in regions with emerging markets. However, they often face challenges such as limited access to financing, technology, and markets. Governments and financial institutions should introduce tailored programs to address these issues, including halal-compliant financing schemes, capacity-building initiatives, and market linkage programs. Empowering SMEs would not only boost economic development but also enhance the inclusivity and resilience of halal supply chains **(Xie & Chai, 2024**).

Consumer awareness and education also need to be prioritized in policy frameworks. Governments and industry stakeholders should work together to increase public understanding of halal principles, certification processes, and the importance of ethical consumption. Campaigns that highlight the value of halal products can strengthen consumer trust and loyalty, driving demand and incentivizing businesses to uphold high standards. Digital platforms and social media can be leveraged to engage consumers and disseminate information effectively (**Ramadhan & Maulidizen, 2024**).

Addressing environmental sustainability is another crucial aspect of strategic recommendations. As the halal industry grows, it must align with global sustainability goals to minimize its ecological footprint. Policies should encourage the adoption of eco-friendly practices across the supply chain, such as reducing waste, optimizing energy use, and sourcing sustainable raw materials. Certification bodies can integrate sustainability criteria into halal certification processes, creating a dual assurance of halal integrity and environmental responsibility.

International collaboration in research and development (R&D) is also vital for advancing the halal supply chain. Governments and academic institutions can establish joint research programs to explore innovative solutions for halal compliance, logistics, and product development (**Maulidizen, 2019**). These collaborations can also focus on understanding consumer behavior and emerging market trends, providing valuable insights for policy formulation and business strategy. By fostering a culture of innovation, the halal industry can stay ahead of challenges and capitalize on opportunities in a dynamic global landscape **(Islam et al., 2018**).

Monitoring and evaluation mechanisms should be incorporated into policy frameworks to ensure accountability and continuous improvement. Governments and industry stakeholders should establish clear benchmarks and performance indicators for halal supply chains, regularly assessing progress and identifying areas for enhancement. Feedback loops involving all stakeholders—producers, distributors, certification bodies, and consumers—can ensure that policies remain relevant and effective in addressing evolving needs (Jayasingh & Wright, 2019).

Optimizing halal supply chains requires a multifaceted approach that includes harmonizing standards, fostering cross-border cooperation, investing in infrastructure and technology, and supporting SMEs. Policies that prioritize human capital development, consumer awareness, sustainability, and R&D can further strengthen the halal ecosystem. By implementing these strategic recommendations, stakeholders can overcome existing barriers and unlock the full potential of halal supply chains, driving economic growth and ensuring the integrity of halal principles in a rapidly changing world (**Sohail, 2022**).

CONCLUSION

The optimization of halal supply chains is critical in ensuring their integrity, efficiency, and global competitiveness. This research highlights the need for harmonizing halal standards, fostering cross-border cooperation, and leveraging advanced technologies to address existing challenges. Furthermore, investments in infrastructure, human capital, and SMEs, along with efforts to enhance consumer awareness and sustainability, can create a robust and reliable halal ecosystem. By addressing these areas, stakeholders can support the growth of the halal industry while maintaining adherence to halal principles and ethical values. Policymakers and stakeholders should prioritize the harmonization of global halal standards and establish

mutual recognition frameworks to simplify international trade. Investments in halal logistics infrastructure and advanced technologies, such as blockchain and IoT, must be incentivized to improve traceability and compliance. Additionally, targeted programs for SMEs, public awareness campaigns, and initiatives promoting environmental sustainability should be integrated into policy frameworks. Collaboration in R&D and the establishment of monitoring systems are also essential for fostering innovation and ensuring continuous improvement across the halal supply chain.

REFERENCES

Ali, M. H., Chung, L., Kumar, A., Zailani, S., & Tan, K. H. (2021). A sustainable Blockchain framework for the halal food supply chain: Lessons from Malaysia. *Technological Forecasting and Social Change*, *170*, 120870. https://doi.org/https://doi.org/10.1016/j.techfore.2021.120870

Ali, M. H., Chung, L., Tan, K. H., Makhbul, Z. M., Zhan, Y., & Tseng, M.-L. (2024). Investigating blockchain technology adoption intention model in halal food small and medium enterprises: moderating role of supply chain integration. *International Journal of Logistics Research and Applications*, *27*(12), 2753–2777. https://doi.org/https://doi.org/10.1080/13675567.2023.2217772

Annisaputri, Harini, C., & Magdalena, M. (2020). The Effect of Product Quality and Price on Purchasing Decisions With Perceptions of Halal Labels as Moderation Variables. *Innovation Research Journal*, *1*(1), 34.

Ardiantono, D. S., Ardyansyah, G. D., Sugihartanto, M. F., Mustofa, M. U. Al, & Lisdiantini, N. (2024). Mapping the barrier and strategic solutions of halal supply chain implementation in small and medium enterprises. *Journal of Islamic Marketing*, *15*(7), 1673–1705. https://doi.org/https://doi.org/10.1108/JIMA-08-2022-0229

Aslam, F., Aimin, W., Li, M., & Rehman, K. U. (2020). Innovation in the Era of IoT and Industry 5.0: Absolute Innovation Management (AIM) Framework. *Journal of Information*, *11*(2), 1–24. https://doi.org/https://doi.org/10.3390/info11020124

Aziz, F., Setyorini, R., & Hasanah, Y. N. (2021). Analisis Halal Supply Chain pada Usaha Mikro Kecil Menengah (UMKM) Makanan di Kota Bandung. *Jurnal Ilmiah Ekonomi Islam*, *7*(1), 293–301.

Brodie, R. J., Ilic, A., Juric, B., & Hollebeek, L. (2013). Consumer engagement in a virtual brand community: An exploratory analysis. *Journal of Business Research*, *66*(1), 105–114. https://doi.org/https://doi.org/10.1016/j.jbusres.2011.07.029

Calder, B. J., Malthouse, E. C., & Schaedel, U. (2009). An experimental study of the relationship between online engagement and advertising effectiveness. *Journal of Interactive Marketing*, *23*(4), 321–331. https://doi.org/https://doi.org/10.1016/j.intmar.2009.07.

Cheng, C., Yang, X., Jiang, F., & Yang, Z. (2023). How to Synergize Different Institutional Logics of Firms in Cross-border Acquisitions: A Matching Theory Perspective. *Management International Review*, *63*, 403–432. https://doi.org/https://doi.org/10.1007/s11575-023-00502-8

Chuang, H.-M., & Chen, C.-I. (2023). The Role of Two-Way Influences on Sustaining Green Brand Engagement and Loyalty in Social Media. *Sustainability*, *15*(2), 1291. https://doi.org/https://doi.org/10.3390/su15021291

Dwivedi, A. (2015). A higher-order model of consumer brand engagement and its impact on loyalty intentions. *Journal of Retailing and Consumer Services*, *24*, 100–109. https://doi.org/https://doi.org/10.1016/j.jretconser.2015.02.007

Fakhruroji, M. (2019). Digitalizing Islamic lectures: Islamic apps and religious engagement in contemporary Indonesia. *Contemporary Islam*, *13*(2), 201–215. https://doi.org/10.1007/s11562-018-0427-9

Fernandes, T., & Esteves, F. (2016). Customer Engagement and Loyalty: A Comparative Study Between Service Contexts. *Services Marketing Quarterly*, *37*(2), 125–139. https://doi.org/https://doi.org/10.1080/15332969.2016.1154744

Ferreira, M., Zambaldi, F., & Guerra, D. de S. (2020). Consumer engagement in social media: scale comparison analysis. *Journal of Product & Brand Management*, *29*(4), 491–503. https://doi.org/https://doi.org/10.1108/JPBM-10-2018-2095

Hatta, I. H., Rachbini, W., & Parenrengi, S. (2018). Analysis of product innovation, product quality, promotion, and price, and purchase decisions. *South East Asia Journal of Contemporary Business*, *16*(5), 183–189.

Hew, J.-J., Wong, L.-W., Tan, G. W.-H., Ooi, K.-B., & Lin, B. (2020). The blockchain-based Halal traceability systems: a hype or reality? *Supply Chain Management*, *25*(6), 863–879. https://doi.org/https://doi.org/10.1108/SCM-01-2020-0044

Hollebeek, L. D., Hammedi, W., & Sprott, D. E. (2023). Consumer engagement, stress, and conservation of resources theory: A review, conceptual development, and future research agenda. *Journal of Psychology & Marketing*, *40*(5), 926–937. https://doi.org/https://doi.org/10.1002/mar.21807

Islam, J. U., Rahman, Z., & Hollebeek, L. D. (2018). Consumer engagement in online brand communities: a solicitation of congruity theory. *Internet Research*, *28*(1), 23–45. https://doi.org/https://doi.org/10.1108/IntR-09-2016-0279

Javaid, M., Haleem, A., Singh, R. P., & Suman, R. (2022). Artificial Intelligence Applications for Industry 4.0: A Literature-Based Study. *Journal of Industrial Integration and Management*, *7*(1), 83–111. https://doi.org/https://doi.org/10.1142/S2424862221300040

Jayasingh, S., & Wright, L. T. (2019). Consumer brand engagement in social networking sites and its effect on brand loyalty. *Cogent Business & Management*, *6*(1), 1698793. https://doi.org/https://doi.org/10.1080/23311975.2019.1698793

Johari, Wahidin, Maghfirah, Zulkifli, Mawardi, & Maulidizen, A. (2024). The Role of Temporary Waqf in Improving the Social Welfare of the Muslim Community. *Journal of Ecohumanism*, *3*(8), 2578–2587. https://doi.org/https://doi.org/10.62754/joe.v3i8.4908

Kolasani, S. (2024). Revolutionizing manufacturing, making it more efficient, flexible, and intelligent with Industry 4.0 innovations. *International Journal of Sustainable Development Through AI, ML and IoT*, *3*(1), 1–17.

Leckie, C., Nyadzayo, M. W., & Johnson, L. W. (2016). Antecedents of consumer brand engagement and brand loyalty. *Journal of Marketing Management*, *32*(5–6), 558–578. https://doi.org/https://doi.org/10.1080/0267257X.2015.1131735

Mas'udah, K. W., Issafira, R. D., Fauziyah, N. A., & Hidayah, E. N. (2022). Improving Skills in Batik Design through Digital Application for a Pesantren Community in Jombang. *ASEAN J. of Community Engagement*, *6*(2), 307–323. https://doi.org/https://doi.org/10.7454/ajce.v6i2.1155

Maulidizen, A. (2019). Business Ethics: Analysis of al-Ghazali's Economic Thought With Sufism Approach. *Religia: Jurnal Ilmu-Ilmu Keislaman*, *22*(2), 160–177. https://doi.org/https://doi.org/10.28918/religia.v22i2.6817

Maulidizen, A. (2020). Analysis of Islamic Consumption Ethics Critical Toward Causes of Corona Virus in Wuhan, China. *Al-Banjari: Jurnal Ilmiah Ilmu-Ilmu Keislaman*, *19*(2), 197–215.

Maulidizen, A. (2024). Resolving Disputes Regarding Trust Financing in Islamic Rural Banks, West Java. *Journal of Islamic Law and Legal Studies*, *1*(1), 37–47. https://doi.org/https://doi.org/10.70063/sharialex.v1i1.5

Maulidizen, A., Rukmana, H. F., & Thoriq, M. R. (2022a). Moneylender and the Welfare of Traders in Parung Market: Theological and Economic Approach. *Journal of International Conference Proceedings (JICP)*, *5*(4), 136–149. https://doi.org/https://doi.org/10.32535/jicp.v5i4.1929

Maulidizen, A., Rukmana, H. F., & Thoriq, M. R. (2022b). Revealing The Existence of Moneylenders in Trading Activities at Parung Market Based on Islamic Economic Principles. *Jurnal Ekonomi*, *11*(03), 556–563.

Mawardi, Bustami, Z., Norhiza, F. L., Darussamin, Z., Syaputra, W., & Maulidizen, A. (2025). Navigating Modernity: Ethical Practices and Islamic Economic Values Among Traditional Second-Hand Goods Traders. *Journal of Ecohumanism*, *4*(1), 412–419. https://doi.org/https://doi.org/10.62754/joe.v4i1.5583

Molinillo, S., Anaya-Sánchez, R., & Liébana-Cabanillas, F. (2020). Analyzing the effect of social support and community factors on customer engagement and its impact on loyalty behaviors toward social commerce websites. *Computers in Human Behavior*, *108*, 105980. https://doi.org/https://doi.org/10.1016/j.chb.2019.04.004

Mundaca, L., & Wamsler, C. (2025). Engaging high-income earners in climate action: Policy insights from survey experiments. *Ecological Economics*, *227*, 108387. https://doi.org/https://doi.org/10.1016/j.slalit.2024.02.008

Quang, H. T., Sampaio, P., Carvalho, M. S., Fernandes, A. C., An, D. T. B., & Vilhenac, E. (2016). An extensive structural model of supply chain quality management and firm performance. *International Journal of Quality & Reliability Management*, *33*(4), 444–464.

Ramadhan, N. K., & Maulidizen, A. (2024). Boosting Donation Engagement: Exploring The Impact Of Accountability And Transparency On Donation Interest In Dompet Dhuafa South Jakarta. *Jurnal Ekonomi*, *13*(3), 650–665.

Sattler, M. (2011). *Excellence in Innovation Management: A Meta Analytic Review on the Predictors of Innovation Performance*. Gabler.

Sohail, M. S. (2022). Understanding consumer engagement in online brand communities: An application of self-expansion theory. *Journal of Marketing Analytics*, *11*, 69–81. https://doi.org/https://doi.org/10.1057/s41270-021-00148-1

Sokolova, I., Kolganova, N., Barbashova, S., & Ovsyannikova, A. (2019). Integration of digital technologies as a factor of post-industrial development. *IOP Conference Series: Materials Science and Engineering*, *497*, 1–5. https://doi.org/10.1088/1757-899X/497/1/012035

Suparpto, W., Tarigan, Z. J. H., & Basana, S. R. (2017). The influence of ERP system to the company performance seen through innovation process, information quality, and information sharing as the intervening variables. *Proceedings of the 1st International*

Conference on Education and Multimedia Technology, 87–91. https://doi.org/https://doi.org/10.1145/3124116.3124131

Suyanto. (2023). The Impact of Modern Markets on Traditional Market Traders' Income. *Innovation Business Management and Accounting Journal*, *2*(3), 127–134. https://doi.org/http://dx.doi.org/10.56070/ibmaj.v2i3.50

Xie, M., & Chai, H. (2024). Synergizing enterprise resource management with technology through driving innovation and growth in business models. *Journal of Intelligent & Fuzzy Systems*, 1–11. https://doi.org/10.3233/JIFS-235379