Integrating Artificial Intelligence into Halal Branding: An Integrative Literature Review of Current Trends and Strategic Implications

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ABSTRACT

Artificial intelligence (AI) offers opportunities to strengthen Halal assurance, traceability, consumer engagement, and responsible business practices. This integrative literature review examines AI applications in Halal-related sectors and their potential implications for brand credibility, consumer trust, and Shariah-aligned governance. Scopus AI was used for exploratory literature identification: 83 exported entries were consolidated into 35 unique publications after removal of 48 repeated records. Of these, 24 journal articles, reviews, and conference papers met the initial document-type criteria for further assessment. Ten accessible publications were provisionally selected for thematic interpretation: seven address AI in Halal-related contexts directly, while three provide contextual perspectives. The synthesis is organised around opportunities, challenges, and applications. The reviewed literature discusses potential benefits from AI-assisted authentication, supply-chain monitoring, tourism services, and culturally appropriate digital engagement. A newly examined conceptual study of ChatGPT in Halal tourism strengthens the evidence base for conversational AI applications. However, proposed benefits must be distinguished from demonstrated branding outcomes. Risks include algorithmic bias, misleading AI claims, opaque decisions, and the need for appropriate Shariah oversight. The findings remain exploratory because screening of the remaining eligible publications is incomplete.

Keywords: Artificial Intelligence, Block chain, Consumer Trust, Halal Branding, Shariah Compliance, and Traceability

INTRODUCTION

Over the past decade, the global Halal market has witnessed explosive growth. This market, which refers to products and services that comply with the religious requirements of Islam, has long outgrown its original scope of only serving niche religious demands. A decade ago, it only served a small group of people with religious

needs, with a small scale and slow development. Today, it has grown into a global industry worth trillions of US dollars, covering multiple fields including food, pharmaceuticals, cosmetics and tourism (Sari et al., 2023). Halal branding is the main driver of this expansion and represents an assurance of religious compliance, safety and ethical integrity for nearly two billion Muslim consumers worldwide (Aoun & Tournois, 2015). But with the market becoming more complex and digitized, traditional means of protecting Halal integrity are under growing pressure and the supply chains are more complex and fraudulent because of globalization, and fraud is now so rampant.

Today, the halal industry has begun to shift to adopting various technologies of Industry 4.0, and there are two main purposes for doing so: first, to verify that the halal attributes of all products are authentic and eliminate the occurrence of counterfeited qualifications; second, to enhance its own brand value. In this industry-wide transformation, Artificial Intelligence has become the most core player. Even though AI can be a gamechanger in the world of religious branding, the integration of high technology automation and religious branding is not easy. The main issue is the clash between technological disruption and religious authenticity. Current AI implementations are often biased towards algorithmic effects, lack of transparency in automated decision-making, and a challenge of reconciling complex data processing with Islamic ethical standards (Aziz & Zulkepli, 2025). Most importantly, AI has not been integrated with the establishment of standards so that brands are at risk of safety and consumer scepticism (Mukherjee et al., 2022).

There has been a lot of research on the technical feasibility of AI in supply chain management and general benefits of blockchain for traceability (Ellahi et al., 2026; Sunmola et al., 2025). The role of AI-based personalization in consumer behaviour and the potential of the metaverse to be an ethical consumer environment have also been explored (Dey, 2025; Sugiana et al., 2024). However, there is a vast research gap that remains: there is not a systematic synthesis of the gap between technical AI capabilities and the strategic branding effects of the Halal market. Most literature is siloed in technical domains or general marketing and there is not a unified strategy that is focused on the cultural and religious nuances of Halal branding.

Although research increasingly addresses AI-enabled Halal authentication, supply-chain integrity, tourism, and digital marketing, the relationship between these technologies and measurable Halal branding outcomes remains insufficiently integrated. Existing reviews of Halal traceability and AI–blockchain systems provide an important foundation (Khan et al., 2025; Nawaz et al., 2025). This review therefore focuses more specifically on the conditions under which technological assurance, consumer-facing engagement, and ethical governance may strengthen or undermine Halal brand credibility.

There are three core objectives to be achieved through this review. The first objective is to identify all current application directions of Artificial Intelligence in use within the Al-Halal industry, then sort and categorize these directions to enable a clear understanding of the overall development context of the field briefly. The second objective is to evaluate these technologies with a critical and scrutinizing perspective: instead of only highlighting their benefits, this study objectively assesses their practical impacts, specifically analyzing how these Artificial Intelligence technologies shape the industry's long-term development strategies from two core dimensions: consumer trust and consumer engagement. The third objective is to clarify the connections between Artificial Intelligence and Al-Halal brands, while organizing all content related to this theme, including the new opportunities that emerge from the integration of the two, the practical challenges encountered, and specific directions for real-world implementation.

The remainder of this article presents the methodology, results and discussion, and conclusion.

METHODOLOGY

Review design and reporting standard

This study adopts an integrative literature review design supported by thematic analysis. The approach enables a critical synthesis of conceptual, review-based, and empirical literature concerning AI applications and their

implications for Halal brand assurance, consumer engagement, and ethical governance. The review is exploratory rather than a completed PRISMA-compliant systematic literature review; the identification and eligibility process is reported transparently. Figure 1 presents the methodological framework.

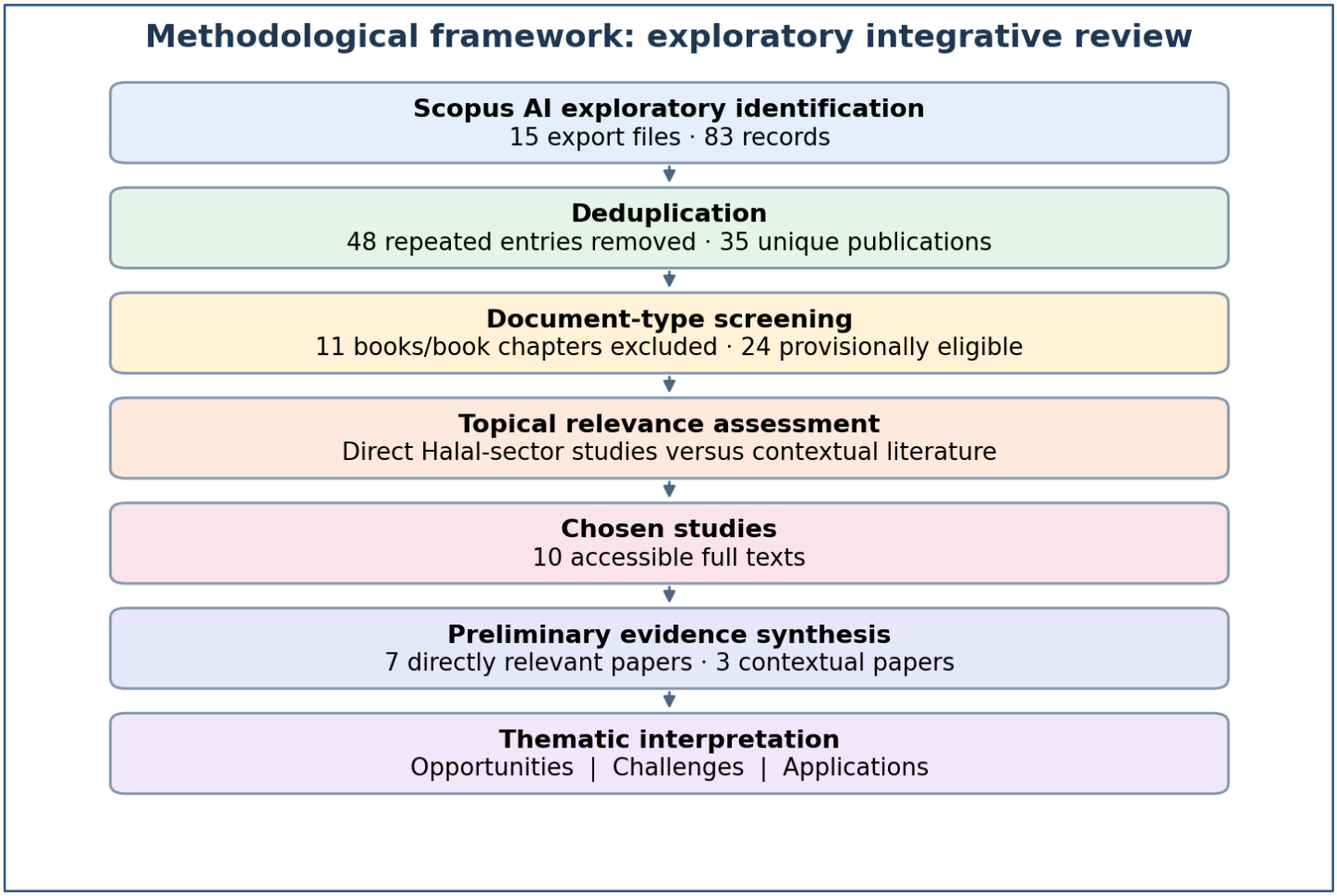

Figure 1: Methodological Framework for literature identification, provisional screening, and thematic interpretation

Based on figure 1, literature identification was conducted using Scopus AI as an exploratory discovery tool, guided by the question: "What are the current trends and strategic implications of integrating artificial intelligence into halal branding?" Keyword combinations covered AI, machine learning, deep learning, Halal products and services, branding, marketing, consumer behaviour, and engagement. Scopus AI publication-export files yielded 83 entries. Deduplication across the exports removed 48 repeated appearances, leaving 35 unique publications. These records should not be interpreted as the output of a comprehensive reproducible Scopus or Web of Science database search.

Eligibility was assessed in stages. Journal articles, review articles, and conference papers were provisionally eligible; books and book chapters were excluded from the core review dataset. Among the 35 unique records, 13 were articles, three were reviews, eight were conference papers, ten were book chapters, and one was a book. Thus, 24 records met the document-type criterion for further topical screening. Relevance assessment considered whether a study directly addressed AI in Halal authentication, supply chains, tourism, branding, or consumer engagement. General AI marketing and Islamic finance ethics studies were treated as contextual sources unless their relevance to the review question could be established.

The original 35-publication inventory (Table 1) represents the deduplicated exploratory discovery pool, not 35 fully screened or critically appraised studies. Ten accessible publications were provisionally selected for thematic interpretation. Seven address AI applications in Halal-related contexts directly, whereas three provide contextual perspectives on responsible AI, sustainability marketing, or Islamic ethics. The ten-study selection

includes Battour et al. (2024), which directly examines ChatGPT in Halal tourism. The remaining provisionally eligible records have not all undergone full-text assessment.

Table 1. The original 35-publication inventory

Authors	Title	Year	Source Title
Arsenijevic U.; Jovic M.	Artificial Intelligence Marketing: Chatbots	2019	Proceedings - 2019 International Conference on Artificial Intelligence: Applications and Innovations, IC-AIAI 2019
Salaheldeen M.	Opportunities for Halal Entrepreneurs in the Islamic Digital Economy: Future and Trends from a Cultural Entrepreneurship Perspective	2022	Cultural Entrepreneurship: New Societal Trends
Battour M.; Mady K.; Elsotouhy M.; Salaheldeen M.;	Artificial Intelligence Applications in Halal Tourism to Assist Muslim Tourist Journey	2022	Lecture Notes in Networks and Systems
Battour M.; Mady K.; Salaheldeen M.; Ratnasari R.T.; Sallem	Halal tourism and ChatGPT: an overview of current trends and future research directions	2024	Journal of Islamic Marketing
Aysan A.F.; Syarif M.F.	Shaping the halal tourism industry landscape through NFT and	2025	Journal of Islamic Marketing
Sunmola F.; Baryannis G.; Tan A.; Co K.;	Holistic Framework for Blockchain-Based Halal Compliance in Supply	2025	Systems
Khan S.; Rabbani M.R.	Chatbot as islamic finance expert (CaIFE): When finance meets artificial intelligence	2020	ACM International Conference Proceeding Series
Alalwan A.A.; Algharabat R.; Abu El Samen A.; Albanna H.;	Examining the impact of anthropomorphism and AI-chatbots service quality on online customer	2025	Journal of Consumer Marketing
Nawaz A.; Afzal A.; Khatibi A.; Shankar A.;	Role of artificial intelligence in halal authentication and traceability: A	2025	Food Control
Ramalho P.; Fernandes P.O.; Oliveira J.; Lopes	Application of Artificial Intelligence in Companies in the Tourism Sector:	2024	Smart Innovation, Systems and Technologies
Battour M.; Salaheldeen M.; Mady K.; Ratnasari	ChatGPT and Halal Travel: An Overview of Current Trends and	2024	Studies in Systems, Decision and Control
Rahman M.M.	Ethical and Technological Convergence: AI and Blockchain in Halal Healthcare	2024	Artificial Intelligence-Enabled Blockchain Technology and Digital Twin for Smart Hospitals
Zerouani H.; Haqiq A.; Bounabat B.	Chatbots Technology and its Challenges: An Overview	2023	Lecture Notes in Networks and Systems
Arantes L.; Costa S.	Converging Theories: The Fusion of Artificial Intelligence and Sustainable	2024	Leveraging AI for Effective Digital Relationship Marketing

Authors	Title	Year	Source Title
Rahman M.	Halal Food Safety in the AI Era: New Horizons for Humanitarian Action	2025	AI for Humanitarianism: Fostering Social Change Through Emerging Technologies
Ozturkcan S.; Bozdağ A.A.	Responsible AI in Marketing: AI Booing and AI Washing Cycle of AI	2025	International Journal of Market Research
Marlinda A.P.; Cipto B.; Al-Fadhat F.; Jubba H.	The Influence of Artificial Intelligence to Support Halal Tourism Policy in	2021	IOP Conference Series: Earth and Environmental Science
Putri V.C.C.; Sonni A.F.	AI-Driven Personal Branding for Female Entrepreneurs: The Indonesian	2025	Journalism and Media
Kismawadi E.R.	Artificial intelligence in Islamic finance: Revolutionizing risk management, auditing, and shariah compliance	2025	AI's Transformative Impact on Finance, Auditing, and Investment
Anwar M.M.	Connecting halal culinary content and tourist intentions: a framework of	2025	Journal of Islamic Marketing
Rahman M.M.	Halal industry 4.0 and knowledge management: Technological	2024	Innovative Ventures and Strategies in Islamic Business
Pavan Kumar P.; Likhita V.; Pranav U.S.	I-LAA: An Education Chabot	2023	Smart Innovation, Systems and Technologies
Kismawadi E.R.; Irfan M.; Harahap I.	Integrating artificial intelligence in Islamic financial management: Opportunities and challenges in maintaining Shariah compliance	2025	Indigenous Empowerment through Human-Machine Interactions: The Challenges and Strategies from Business Lenses
Khan N.; Falahat M.; Ullah I.; Sikandar H.;	Technological innovation for religious compliance: a framework for AI and	2025	Journal of Islamic Marketing
Ellahi R.M.; Wood L.C.; Bekhit A.E.-D.A.	A multi-layer Industry 4.0 framework for ensuring halal integrity in NZ meat	2026	Food Control
Kismawadi E.R.; Irfan M.; Yadav A.K.	Advancing Islamic Finance With Blockchain and Generative Artificial	2025	Generative AI Insights for Financial Decision Making
Garg V.; Bohara S.; Srivastav A.	AI-driven sustainability marketing transforming consumers' perception	2025	Discover Sustainability
Aziz M.S.A.; Zulkepli M.I.S.	Algorithmic Bias In Ai-Based Credit Assessment In Islamic Financial	2025	Quranica
Mohd Amin M.R.; Wider W.; Sivakumaran	Artificial intelligence-driven approaches for halal tourism and	2026	Journal of Islamic Marketing
Masood A.; Mohd Soffian Lee U.H.; Abdul	HALAL REIMAGINED: IR4.0 TECH DRIVES SUSTAINABILITY AND	2025	Malaysian Journal of Syariah and Law
Jamaludin N.F.; Saharuddin N.; Nazir N.	Navigating Crises in the Halal Cosmetic Industry: Embracing Emerging Technologies for Resilience	2024	Emerging Technology and Crisis Management in The Halal Industry: Issues and Recent

Authors	Title	Year	Source Title
Arifardhani Y.; Ahmat N.H.C.; Mukri M.	The Role of Law in AI-Based Business Ecosystems: A Contextualized Perspective from Islamic Law	2025	Jurnal Ilmiah Mizani
Naim A.	Transforming Business Practices With AI-Powered Green Marketing	2025	Transforming Business Practices With AI-Powered Green
Mollay M.H.; Sharma D.; Anawade P.; Rafique A.A.A.; Akpabio E.	Trust in Artificial Intelligence Marketing: How AI-Powered Chatbots and Algorithms Influence Consumer Trust in Automated Systems	2026	Lecture Notes in Electrical Engineering
Dey C.	Understanding the influence of AI-driven personalized recommendations on consumer buying behavior in halal marketing	2025	Journal of Islamic Marketing

The ten selected publications are presented in Table 2. Seven provide direct Halal-sector evidence or conceptual discussion, while three support cross-contextual interpretation. The additional studies by Aysan and Syarif (2025) and Sudirman et al. (2025) inform the wider discussion but are not counted among the ten papers in the preliminary thematic synthesis.

Table 2. Ten publications used for preliminary thematic interpretation.

Study	Main focus	Role in synthesis
Nawaz et al. (2025)	AI authentication and traceability	Core — review
Sunmola et al. (2025)	AI–blockchain Halal supply-chain compliance	Core — framework
Battour et al. (2022)	AI applications for Muslim tourists	Core — conceptual
Marlinda et al. (2021)	Digital applications and Halal tourism policy	Core — caution on AI attribution
Putri & Sonni (2025)	AI-driven branding among hijabi entrepreneurs	Core — empirical
Masood et al. (2025)	Industry 4.0, sustainability and Islamic values	Core — conceptual
Battour et al. (2024)	ChatGPT applications in Halal tourism	Core — conceptual review
Ozturkcan & Bozdağ (2025)	AI washing and marketing mistrust	Contextual — non-Halal marketing
Garg et al. (2025)	AI-driven sustainability marketing	Contextual — non-Halal marketing
Aziz & Zulkepli (2025)	Algorithmic fairness and Islamic ethics	Contextual — Islamic finance

The preliminary thematic analysis uses three sensitising categories reflected in the Scopus AI concept map: opportunities, challenges, and applications. Full-text reading informed provisional codes including authentication, traceability, operational efficiency, sustainability, tourism assistance, conversational AI,

consumer engagement, algorithmic fairness, Shariah alignment, and AI washing. The ten studies were compared according to their contexts and evidence types, with conceptual proposals distinguished from empirical findings. The Scopus AI map served as a starting point for coding rather than independent evidence validating the themes.

The synthesis evaluates a proposed pathway from AI-enabled operational assurance and culturally appropriate digital engagement to potential Halal brand credibility, subject to transparent communication and accountable governance. This is an interpretive framework rather than a tested causal model. Accordingly, claims about improved trust, loyalty, certification speed, or sustainability are expressed as possibilities unless supported by direct evidence in the reviewed study.

RESULTS AND DISCUSSION

The preliminary synthesis retains the original focus on AI trends, consumer trust and engagement, and the interconnected opportunities, challenges, and applications of AI in Halal branding. Seven directly relevant and three contextual full-text publications inform the interpretation. Evidence for AI-enabled authentication, traceability, and Halal tourism applications is stronger than evidence that such applications measurably increase brand equity or loyalty. The following sections distinguish reported findings, conceptual proposals, and strategic inferences.

Current trends in AI applications within halal sector

Nawaz et al. (2025) review AI techniques relevant to Halal authentication and traceability, including machine learning and computer vision. These approaches may assist ingredient verification and process monitoring. However, the literature reviewed does not establish that such systems are routinely deployed across the Halal sector or that they replace human certification authorities. Claims of widespread national AI-based certification implementation require separate verification.

A second trend is the proposed integration of AI with blockchain-based traceability. Sunmola et al. (2025) develop a framework in which AI supports analytical or decision functions while blockchain records supply-chain events. Blockchain is a complementary record-keeping technology, not a type of AI. The combination could improve auditability, but the extent to which it reduces fraud or increases consumer trust remains an empirical question.

Consumer-facing AI applications include travel information, recommendations, and digital communication. Battour et al. (2022) outline potential AI assistance throughout the Muslim tourist journey. More specifically, Battour et al. (2024) review possible ChatGPT applications before, during, and after Halal tourism experiences, identifying opportunities for personalised assistance alongside implementation challenges. Putri and Sonni (2025) examine AI-assisted personal branding among Indonesian hijabi entrepreneurs. These studies support the relevance of culturally appropriate engagement but do not demonstrate widespread deployment or measurable improvements in Halal brand loyalty.

Immersive technologies, including metaverse environments and non-fungible tokens (NFTs), are discussed in Halal tourism literature. Aysan and Syarif (2025) explore their implications for Halal brands and hotel booking platforms, including potential benefits and concerns about privacy, cybersecurity, access, and religious compliance. However, NFTs and the metaverse are not inherently AI technologies. This study is therefore used as contextual literature rather than counted as direct evidence of AI effectiveness.

Responsible AI introduces a necessary governance dimension. Ozturkcan and Bozdağ (2025) discuss the risk of AI washing and consumer mistrust in marketing, while Aziz and Zulkepli (2025) analyse algorithmic bias through an Islamic ethical lens in financial services. These studies provide transferable concerns about honesty, fairness, and transparency; they do not directly demonstrate consumer responses to AI-based Halal certification.

Across the reviewed contexts, transparency is not synonymous with trust. AI-generated classifications can be difficult to explain, and a technically traceable record may still contain inaccurate inputs. Halal brands therefore

need verifiable source data, clear responsibility for decisions, and human oversight where religious compliance is at stake. This is a strategic implication derived from comparing the studies, not an outcome directly tested across the literature.

Strategic Implications for brand trust and consumer engagement

AI-assisted authentication and traceability may strengthen the information available to consumers about Halal provenance. Nawaz et al. (2025) review these technical possibilities, and Sunmola et al. (2025) propose an integrated compliance framework. However, the availability of auditable data does not automatically establish consumer trust. Brand credibility is more plausibly strengthened when evidence is understandable, independently verifiable, and aligned with recognised Halal certification practices.

For branding, the strategic shift is from relying solely on a certification claim to communicating substantiated assurance information alongside recognised certification. This should not be interpreted as replacing the Halal logo or the authority responsible for certification. The proposed value lies in giving consumers meaningful supporting evidence; whether this changes purchase intention or loyalty requires direct consumer research.

AI-enabled personalisation offers a potential route to consumer engagement. Battour et al. (2022) identify opportunities for Muslim-friendly travel assistance, while Battour et al. (2024) discuss ChatGPT-supported information and services across different stages of the tourist journey. Putri and Sonni (2025) provide a complementary perspective through culturally situated entrepreneurial branding. Together, these studies suggest that personalisation should account for religious and cultural needs, although effects on Halal brand loyalty require empirical testing.

Virtual tours and immersive brand storytelling may offer opportunities to explain sourcing and production practices. Aysan and Syarif (2025) discuss NFTs and metaverse applications in Halal tourism, but these technologies should not be classified as AI without an identified AI component. Their potential branding value remains a contextual proposition, not demonstrated evidence of AI-enabled consumer trust.

The central challenge is that automated decisions may be difficult to audit and can reproduce biases. Aziz and Zulkepli (2025) examine these issues in Islamic finance, providing an ethical perspective relevant by analogy to Halal branding. Ozturkcan and Bozdağ (2025) additionally warn that overstated AI claims can create mistrust. These insights support a cautious governance argument rather than a claim that specific Halal brands have already experienced these outcomes.

If halal brands (the brands that cater to Islamic religious requirements on products and services) are to have AI integrated into their everyday lives, they need to first marry it to moral and religious principles and not use it arbitrarily without these basic requirements. AI must not only be limited to efficiency improvements, it cannot only make business processes faster and easier but must also meet the moral and social obligations that brands can carry (Kamali, 2024; Mukherjee et al., 2022). Besides, if AI works in concert with these values, then brands will also could build long-term relationships with Muslim consumers who are used to using technology rather than just making one-off transactions (Mishra & Sybol, 2025).

More importantly, the integration of technology is only to complement the core values of halal consumption and technology should not take the place of the core values and lead consumers to only focus on technology and forget the major ethical aspect of halal consumption. It is only by doing this that AI can strengthen a brand's digital operations, core identity positioning and consistency with halal practices (Aoun & Tournois, 2015; Mishra & Sybol, 2025).

Connecting AI and Halal Branding: Opportunities, Challenges, and Applications

The Scopus AI concept map provides a preliminary organising framework consisting of opportunities, challenges, and applications. The categories are used here as analytical headings and are refined through

interpretation of the accessible full texts. Figure 2 depicts the exploratory map; it should not be represented as a statistically derived network or as independent proof of the strength of relationships among themes.

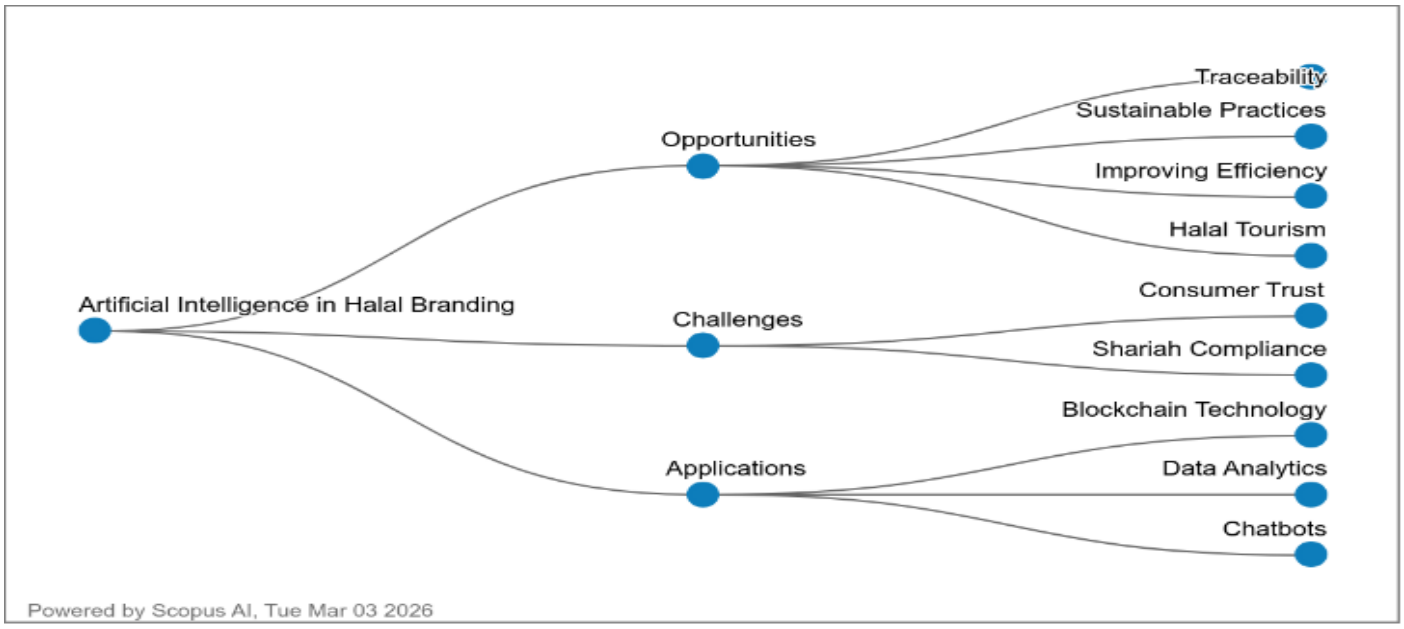

Figure 2: Exploratory Scopus AI concept map of opportunities, challenges, and applications in Halal Branding

The first pillar of this nexus is the strategic opportunities AI could provide for the Halal sector in terms of traceability, sustainability and operational efficiency. Machine learning and computer vision technologies give real-time information on the integrity of the production process in Halal (from raw materials to final point of sale) in order to minimize the risk of cross-contamination or fraud (Nawaz et al., 2025; Rahman et al., 2025). AI-based tools are revolutionizing Halal tourism, with the ability to tailor travel experiences for Muslim travellers to the specific religious and dietary preferences and tailor them with predictive analytics and personalized recommendations (Battour et al., 2024; Mohd Amin et al., 2026). The opportunities bring brands a chance to be ethical and environmental and have a holistic approach to Halalan Toyyiban (Masood et al., 2025).

But obstacles still need to be overcome for the adoption of these technologies. The main problem is consumer trust as changing from manual certification of Halal products to automated can create skepticism if decision-making systems are seen as 'black boxes' (Ozturkcan & Bozdağ, 2025). Shariah compliance is still a concern as AI systems and algorithms should do what is required to be in accordance with Quranic and Islamic ethical guidelines in the field of data privacy and algorithmic bias (Kismawadi et al., 2025; Aziz & Zulkepli, 2025). And so we need to tackle these issues to avoid a 'trust deficit' that may lead to the Halal brand being perceived as compromised (Sunmola et al., 2025).

Applications discussed in the literature include AI-supported authentication and analytics, proposed AI–blockchain compliance systems, and AI-assisted tourism or branding communication. These should be distinguished from adjacent technologies and general marketing tools. Direct evidence for consumer-facing Halal certification chatbots is limited in the available full-text set; general chatbot studies may be used only as contextual support.

Opportunities for Traceability

The incorporation of Artificial Intelligence (AI) in Halal branding is a paradigm shift in traceability as it helps in automating complex compliance checks and the continuous life cycle of a product. AI technologies for food and healthcare (Rahman, 2025; Nawaz et al., 2025) can ensure continuous monitoring of Halal standards from the initial sourcing to final consumption (Rahman, 2025). The use of automated verification technology can lead to Halal authentication that is more accurate than manual verification, which is fundamental for consumer trust

and confidence in brand integrity (Sunmola et al., 2025). This automated check ensures that Halal supply chain compliance with religious and safety requirements are met in real time (Ellahi et al., 2026).

The most important strategic investment in this link is the linking up of AI with blockchain to create a complex, multi-layer framework for religious compliance. Blockchain is a decentralized and transparent platform for product provenance, and AI adds predictive intelligence and data analytics (Khan et al., 2025). The combination enhances data security and operational transparency (Rahman, 2024), and ensures that Halal certification protocols are secure from a threat from outside (Ellahi et al., 2026). For sectors such as meat production, the combined framework supports continuous compliance and allows for a documented audit trail that is an integral component of modern Halal branding.

Furthermore, AI-powered traceability is meant to address systemic inefficiencies and fraud that have historically plagued traditional Halal certification methods. AI-enabled systems help minimize these difficulties by providing high-quality verification to small and medium enterprises (SMEs) to demonstrate their religious compliance (Khan et al., 2025). The technology-enabled solution not only facilitates supply chain security and ethical consumerism but also in the global Islamic economy (Masood et al., 2025) by reducing mislabeling and fraud and thus helps Halal brands be able to reimagine their value proposition and move towards a more inclusive and technologically robust landscape (Masood et al., 2025).

Opportunities for Sustainability and Ethical Practices

Using Artificial Intelligence (AI) in Halal branding is a strong link to sustainable practices and ethical sourcing and product integrity in the global food industry. In the face of AI-driven compliance mechanisms, companies can achieve remarkable transparency and traceability, which is important for food safety and ethical consumerism (Rahman, 2025). Halal products are not only religiously permissible but produced in accordance with Halalan Toyyiban's ethical requirements; they ensure that the brand identity is in line with the current global context of responsible consumption (Rahman, 2025).

Such integration with Industry 4.0 technologies, such as the Internet of Things (IoT) and big data analytics, further drives this link by optimizing resource utilization and operational transparency (Rahman, 2024). These advanced systems allow Halal businesses to reduce waste and comply with both religious and environmental standards, resulting in greater trust for customers (Masood et al., 2025). The economic and environmental sustainability is at the heart of the "Halal reimagined" movement that attempts to create sustainable economic growth that is anchored in Islamic values (Masood et al., 2025).

AI not only enhances operational efficiency but also provides an impact on consumer perception and behaviour through customized, eco-friendly messaging. With AI as the enabler for green marketing strategies, Halal brands can have long-term loyalty with sustainable consumers and bridge the gap between spirituality and environmental responsibility (Garg et al., 2025; Naim, 2025). This is the intersection of AI with sustainable marketing that creates the basis for Halal branding to be a role model for religious authenticity and global environmental stewardship (Arantes & Costa, 2024).

Opportunities for Operational Efficiency

AI-assisted monitoring and automated analysis could reduce repetitive compliance-related tasks and improve the detection of anomalies. Nawaz et al. (2025) discuss such applications, while Sunmola et al. (2025) present an integrated architecture for supply-chain compliance. However, the available studies do not establish a general reduction in certification costs or processing time across Halal authorities. Efficiency gains therefore remain context-dependent possibilities rather than demonstrated industry-wide outcomes.

AI improves the efficiency of the supply chain by enabling real-time transparency and predictive monitoring in addition to administrative functions. This technological solution addresses the challenges faced by food safety and ethical sourcing by automating the identification of non-compliance and ensuring product integrity from farm to fork (Rahman, 2025; Nawaz et al., 2025), and by connecting AI and data analytics to product

development, companies can utilize machine learning to create products that are in line with consumer demand and comply with Halal specifications (Masood et al., 2025). This data-driven approach minimizes market entry risk and ensures that products with the most religious and commercial significance are allocated to market (Rahman, 2024).

Finally, AI and efficiency are interrelated and connect to the sustainability and inclusive growth of the Halal business. AI is key to the economic sustainability and sustainability of companies and the environment in the business climate by optimizing resource utilization and waste management through smart processes (Masood et al., 2025). These operational improvements are central to the "Halal Reimagined" movement where industry 4.0 technologies build a more inclusive and efficient monetary environment (Masood et al., 2025). This is why AI strategy to maximize efficiency will further increase the competitive status of Halal products and make for an easier and more stable global Islamic economy (Rahman, 2024).

Opportunities for Halal Tourism

Halal tourism provides a consumer-facing setting for AI-assisted information and service personalisation. Battour et al. (2022) discuss how intelligent tools could support Muslim travellers across different stages of their journey. Marlinda et al. (2021) examine digital applications in the context of Halal tourism policy in South Korea. Their contributions indicate relevant opportunities, but the presence of a tourism application should not itself be taken as proof that it uses AI.

The strategic relevance of these studies lies in improving access to accurate Muslim-friendly travel information and supporting culturally appropriate service experiences. Whether these services strengthen destination or hotel brand trust depends on reliability, privacy, and consistency with recognised Halal requirements. The reviewed evidence does not warrant a general claim that such trust improvements have already been demonstrated.

NFTs and metaverse-based hotel experiences are discussed in adjacent Halal tourism scholarship, but neither technology is inherently AI. They remain useful examples of broader digital innovation rather than direct evidence of AI effectiveness. Any future AI-enabled immersive service should be evaluated for accuracy, accessibility, privacy, and religious appropriateness.

Present days, there are still concerns. The application of such technologies in Halal tourism cannot remove two big issues: data privacy and Shariah compliance. Despite these issues, AI in Halal tourism can not only enhance travel and make it more convenient for travelers but can also establish the foundation for the long-run development of the global Halal hotel industry (Battour et al., 2024).

Challenges : Consumer Trust

The studies reveal a tension between technological assurance and credible communication. Nawaz et al. (2025) and Sunmola et al. (2025) describe or propose systems that can improve access to compliance information. By contrast, Ozturkcan and Bozdağ (2025) caution that exaggerated AI claims can undermine confidence. The comparison suggests that Halal brand trust cannot be secured by technology claims alone; the underlying information must be accurate, auditable, and clearly explained.

To overcome these difficulties, the need for trust frameworks that are also based on the technology's usefulness and relates to Islamic values (Mohd Amin et al., 2026). In general, consumers are more likely to trust AI-driven Halal services if they see Halal assurance signals and have access to high-quality, secure user interfaces (Nawaz et al., 2025). Ethical AI use should also place a high priority on data management and algorithmic fairness to ensure that technology improves rather than displaces our own judgment in religious matters (Sunmola et al., 2025).

Challenges : Shariah Compliance and Ethical Governance

Shariah compliance requires more than an automated classification of products or transactions. Sunmola et al. (2025) emphasise the need for reliable compliance information in supply chains, while Aziz and Zulkepli (2025)

offer an Islamic ethical perspective on algorithmic fairness in a different sector. Read together, these studies support human oversight, clear accountability, and consultation with qualified Halal authorities. The transfer of principles from Islamic finance to Halal branding is an analytical interpretation, not direct empirical evidence.

Hence, the development of a Shariah-compliant AI ecosystem requires intensive collaboration between technology developers and Islamic finance and law experts in order to ensure that digital business models are legally and religiously sound (Arifardhani et al., 2025). This is especially the case in Islamic financial management and Halal branding in which the law needs to provide context to AI-based interactions (Arifardhani et al., 2025). While AI opens new avenues for transparency and traceability, its application in the Halal industry will require ethical standards and a strict adherence to Shariah ethics to address these systemic issues (Rahman, 2025).

Applications: AI and Block Chain Integration

AI and blockchain have distinct but potentially complementary functions in Halal supply chains. Blockchain can preserve a shared record of transactions and provenance claims; AI can support pattern recognition, risk identification, and analysis of relevant data. Sunmola et al. (2025) propose their integration, while Nawaz et al. (2025) review authentication and traceability applications. A tamper-resistant ledger does not, by itself, verify that recorded inputs are true or religiously compliant.

Artificial Intelligence and blockchain integration also can enhance the efficiency of Halal supply chain management. AI can be used to automate routine monitoring and analysis and blockchain for reliable verification and recording of data. It also reduces the need for manual processes and could save time and resources in Halal auditing and compliance (Kismawadi et al., 2025). But more importantly, these technologies can help businesses improve operational efficiency while also being in line with religious beliefs. And this reflects the wider industry trend towards Industry 4.0 in Halal where digital technologies are increasingly incorporated in business operations and compliance practices (Rahman, 2024).

Finally, the integration of AI and blockchain will help to build trust in Halal brands. A transparent digital system enables brands to verify the authenticity and trace of the information and to demonstrate to customers that the products are being responsibly sourced and Sharia compliant (Nawaz et al., 2025). Instead of simply branding Halal as a marketing assertion, brands can give consumers tangible proof of their compliance. AI and blockchain can then facilitate the more transparent and accountable relationship between Halal brands and Muslim consumers (Khan et al., 2025).

Applications: Data Analytics and Consumer-facing tool

AI is a great data analytics tool for Halal branding, because quality control and compliance with religious safety standards are very well developed. AI-based analytics can verify the authenticity of Halal products by constantly monitoring production environments and ingredient lists, with machine learning and computer vision (Nawaz et al., 2025). This monitoring is needed to maintain product integrity in the Halal food industry because even a small deviation can lead to brand damage and even religious disinterest (Rahman, 2025).

AI and big data-driven analytics combine to build Halal brands with solid crisis management solutions and are particularly helpful for the sensitive sector of Halal cosmetics. Analytics systems can identify dangers or supply chain problems before they escalate, and companies can respond to safety issues and protect their brand reputation (Jamaludin et al., 2024). In a market where religious verification is needed (Rahman, 2024), this resilience is very important to keep the customer's trust and faith in the system.

In addition to compliance, data analytics also offer Halal brands insights into how to tailor marketing strategies to their customers. AI-driven personalized recommendations bring product visibility and convenience to the market and engage and appeal to tech-savvy Muslim consumers (Dey, 2025). While digital tools can influence consumer purchasing trends, data suggest that people still depend on community validation and official religious verification as the main factors in their final purchase decisions (Dey, 2025).

AI analytics may assist in interpreting large datasets, detecting anomalies, and generating information relevant to product assurance. When combined with blockchain, analytics can support a proposed traceability architecture; however, describing this combination as an established industry standard would overstate the evidence. Independent evaluation is needed to determine its reliability, implementation costs, and implications for brand trust.

Conversational AI may help Muslim travellers obtain information about accommodation, food, prayer facilities, and destination services. Battour et al. (2024) specifically examine the potential role of ChatGPT across pre-trip, on-trip, and post-trip stages, strengthening the AI-specific basis for this application theme. Their paper is conceptual, however, and does not establish widespread adoption or proven effects on Halal brand loyalty. Chatbot responses should not substitute for official Halal certification or authoritative religious advice.

From a branding perspective, conversational AI may improve the accessibility and responsiveness of service information, but such benefits depend on accuracy, privacy safeguards, cultural appropriateness, and clear escalation to human personnel. General chatbot marketing research (Arsenijevic & Jovic, 2019; Alalwan et al., 2025) provides contextual insights only; its findings should not be generalised automatically to Halal consumers.

CONCLUSION

This integrative review identifies promising connections between AI applications and Halal branding through three interrelated areas: opportunities, challenges, and applications. The most directly relevant accessible studies examine or propose AI-assisted authentication, traceability, supply-chain compliance, tourism services, and culturally appropriate branding. The synthesis suggests that these capabilities may support brand credibility when accompanied by reliable evidence and transparent communication. It does not establish that AI adoption automatically increases consumer trust, loyalty, certification efficiency, or sustainability.

The findings also highlight unresolved risks involving data accuracy, algorithmic bias, opaque decision-making, and AI washing. Shariah-aligned governance requires appropriate human oversight and accountability, especially where automated systems inform compliance decisions. The analysis draws on ten accessible full texts, including three contextual studies outside direct Halal AI applications; it is therefore exploratory and cannot claim comprehensive coverage of all 24 provisionally eligible records. Aysan and Syarif (2025) and Sudirman et al. (2025) provide supplementary perspectives on digital Halal branding and Islamic AI governance, respectively, without being counted as additional core studies.

Future research should test the proposed links between AI-enabled assurance, consumer understanding, and brand outcomes using empirical consumer and organisational data. Comparative studies across Halal sectors and certification regimes could clarify when AI provides genuine operational value. Further full-text retrieval and documented eligibility assessment are also necessary to complete the literature screening and strengthen the review's identical foundation.

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Conflict Of Interest

The authors have no conflicts of interest.

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