



Digital Halal Certification, Fiqh Muamalah and Islamic Commercial Law in the Global Trade Era

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Abstract

Purpose – This study examines the digital transformation of halal certification from the perspective of fiqh muamalah, focusing on how emerging technologies, including blockchain, the Internet of Things (IoT), and artificial intelligence (AI), can be incorporated into halal governance while remaining consistent with maqashid al-shariah. The study addresses structural limitations in conventional paper-based certification systems, particularly fragmented standards, weak traceability, and risks of fraudulent practices, within the rapidly expanding global halal industry. **Design/methods/approach** – The study employs a normative-qualitative legal research approach that combines doctrinal analysis of fundamental principles of fiqh muamalah with a literature review of contemporary scholarship on halal technology and digital certification. The analysis evaluates digital certification mechanisms against key Islamic commercial principles, including shidq (truthfulness), amanah (trustworthiness), and the prevention of gharar (uncertainty), while also considering the role of collective juristic reasoning (ijtihad jama'i) in technological implementation. **Findings** – The findings indicate that blockchain, IoT, AI, and related digital certification mechanisms are broadly compatible with fundamental muamalah principles when they enhance transparency, traceability, accountability, and the prevention of uncertainty. However, technological automation cannot replace substantive religious judgment in determining halal status. Human juristic oversight therefore remains essential. The study also identifies persistent challenges in cross-border halal recognition arising from differences among national and international standards, including those implemented by Indonesia's BPJPH, Malaysia's JAKIM, and the OIC/SMIIC framework. These differences demonstrate that technological interoperability alone cannot resolve underlying fiqh-based divergences. **Research implications/limitations** – The study highlights the need to integrate technological innovation with institutional and Shariah governance mechanisms. Digital halal certification requires not only interoperable technological infrastructure but also greater harmonisation of standards, regulatory coordination, and continuous scholarly supervision. As a normative-qualitative study based primarily on doctrinal sources and existing literature, its conclusions do not empirically assess the technical performance, implementation costs, or user acceptance of specific digital certification systems. Future research should therefore incorporate empirical and comparative studies of digital halal certification practices across jurisdictions. **Originality/value** – This study contributes to Islamic legal scholarship and halal governance by developing a Shariah-compliant conceptual framework for the digital transformation of halal certification. It proposes an integrated model in which blockchain and smart contracts support automated compliance monitoring and traceability, while AI and IoT facilitate data-driven verification, without displacing the authority of qualified ulama and collective ijtihad. The framework positions digital technology not as a substitute for Islamic legal judgment, but as a governance instrument that can strengthen the transparency, integrity, and global interoperability of the halal ecosystem.

Keywords: Digital Halal Certification; Fiqh Muamalah; Islamic Commercial Law; Blockchain; Maqashid al-shariah; Global Halal Trade

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Introduction

Halal certification has evolved from a localised religious endorsement into a globally traded regulatory instrument that underpins one of the fastest-growing segments of the world economy. Muslims constitute close to a quarter of the global population, and the demand for verifiably halal food, pharmaceuticals, cosmetics, and financial products continues to expand well beyond Muslim-majority states, driven both by religious obligation and by a broader consumer perception of halal as a marker of quality, safety, and ethical production [1]. As halal supply chains have become longer, more fragmented, and more international – spanning raw-material sourcing in one country, processing in a second, and consumption in a third – the reliability of certification has become increasingly difficult to guarantee through conventional, paper-based audit and labelling systems.

Conventional halal certification typically relies on periodic physical inspection, manual documentation, and a static certificate or logo that, once issued, is difficult to verify in real time and easy to counterfeit. Reported cases of mislabelling, cross-contamination, and outright fraud in halal supply chains have repeatedly undermined consumer trust and have prompted calls – from regulators, industry, and Islamic legal scholars alike – for more robust, technologically enabled assurance mechanisms [2]. In response, halal-industry stakeholders across Indonesia, Malaysia, the Gulf Cooperation Council states, and beyond have begun to experiment with digital tools: blockchain-based ledgers that render certification records immutable and traceable, Internet of Things (IoT) sensors that monitor slaughtering, storage, and transport conditions in real time, and artificial intelligence systems that flag anomalies in supply-chain data.

This technological shift raises a question that is as much jurisprudential as it is technical: can digital instruments genuinely satisfy the requirements of Islamic commercial law (*fiqh muamalah*), or do they introduce new forms of uncertainty (*gharar*), opacity, or unwarranted delegation of religious judgment to non-human systems? *Fiqh muamalah* – the branch of Islamic jurisprudence governing contracts, trade, and economic conduct – does not merely regulate the substantive permissibility (*halal status*) of a product; it also prescribes the manner in which transactions and attestations must be conducted, emphasising honesty (*shidq*), trustworthiness (*amanah*), clarity of contractual terms, and the avoidance of excessive uncertainty [3]. A halal certificate is, in *fiqh* terms, a form of testimony (*shahadah*) as much as it is a regulatory document, and testimony in Islamic law carries specific requirements regarding the competence, integrity, and accountability of the party issuing it. Whether – and how – a blockchain

ledger, an algorithm, or a smart contract can bear or support that testimonial function is a question this paper seeks to address.

Global trade compounds the difficulty. Because halal standards are not uniform across jurisdictions — Malaysia's JAKIM standard follows predominantly the Shafi'i school, Indonesia's MUI/BPJPH framework accommodates multiple schools (*madhahib*), and the OIC/SMIIC standard was designed to be madhhab-inclusive — a product certified halal for export from one country may face renewed scrutiny, or even rejection, upon entering another. Digital traceability systems can make the origin and handling of a product more transparent, but transparency alone does not resolve underlying disagreements in juristic interpretation (*ijtihad*) about issues such as mechanical slaughter, stunning, or the use of enzymes and additives of uncertain origin [4]. This paper therefore situates the technical discussion of digital halal certification within the broader legal-institutional debate on the harmonisation of halal standards for global trade.

Against this background, the present study aims to: (1) map the principal digital technologies currently being applied to halal certification and traceability; (2) analyse these technologies through the normative framework of fiqh muamalah, with particular attention to the doctrines of *shidq*, *amanah*, *gharar*, and *maqashid al-shariah*; (3) examine the institutional and cross-border challenges that digitalisation alone cannot resolve; and (4) propose a conceptual framework for Shariah-compliant digital governance of halal certification that preserves the centrality of qualified juristic oversight while leveraging the efficiency gains of digital infrastructure. In doing so, the paper contributes to the growing multidisciplinary literature at the intersection of Islamic law, technology governance, and international trade.

Method

This study employs a normative-qualitative legal research method, characteristic of Islamic legal and comparative-law scholarship, combined with a structured literature review of contemporary interdisciplinary research on halal technology and trade. The normative-doctrinal component draws on classical and contemporary fiqh muamalah literature to construct an analytical framework grounded in the principles of *shidq*, *amanah*, *gharar* avoidance, valid testimony (*shahadah*), and *maqashid al-shariah*. This framework is then applied, through content analysis, to the functional characteristics of three digital technologies most frequently discussed in the halal-certification literature: blockchain-based ledgers, IoT-based real-time monitoring, and artificial-intelligence-assisted anomaly detection.

The literature review component synthesises peer-reviewed studies published between 2017 and 2026 that address halal certification, blockchain and digital traceability in halal supply chains, and the harmonisation of international halal standards, sourced from academic databases and journal repositories including Emerald, MDPI, Springer, and JOIV. Sources were selected for their direct relevance to the intersection of digital technology and halal governance and were analysed thematically rather than statistically, consistent with the qualitative, doctrinal orientation of the study. The combination of doctrinal fiqh analysis with empirical technology literature allows the paper to move beyond a purely technical evaluation of digital tools and beyond a purely abstract doctrinal discussion, situating both within a single analytical frame relevant to policymakers, halal certification bodies, and Islamic legal scholars.

Result

Table 1. Comparative Overview of Major Halal Certification Standards

Aspect	JAKIM (Malaysia)	BPJPH / MUI (Indonesia)	OIC/SMIIC (Turkey, multilateral)	Relevance to Digital Certification
Certifying / accrediting authority	Department of Islamic Development Malaysia (JAKIM)	Halal Product Assurance Organising Agency (BPJPH), with fatwa issued by MUI	Standards and Metrology Institute for the OIC Member States (SMIIC), accrediting national Halal Certification Bodies	Determines which authority's digital signature/ledger entry is treated as authoritative
Madhhab (school of law) basis	Predominantly Shafi'i	Accommodates Shafi'i, Hanafi, Maliki, and Hanbali	Designed to be inclusive across all four Sunni madhahib	Digital records should tag the applicable madhhab/fatwa basis, not only a binary halal flag
Scope of standard	Food, cosmetics, pharmaceuticals, logistics	Food, beverages, cosmetics, chemical & biological products, goods in general (mandatory since Law No. 33/2014)	Framework standard for mutual recognition among OIC member states' certification bodies	Wider scope increases the volume and complexity of data a digital ledger must capture
Legal basis	Trade Descriptions Act 2011 (Halal certification and labelling)	Law No. 33/2014 on Halal Product Assurance (Jaminan Produk Halal)	OIC/SMIIC Halal accreditation protocol under ISO/Codex-aligned procedures	Establishes the legal weight a blockchain-recorded certificate carries in each jurisdiction
Reported digital-technology adoption	Emerging pilot initiatives in supply-chain traceability	Active exploration of blockchain-based certification (BPJPH/LPH pilot engagement)	Advocated as a platform for cross-border mutual recognition of digitally issued certificates	Indicates readiness for the three-layer governance framework proposed in Section 4.6

Discussion

Fiqh Muamalah: Foundational Principles

Fiqh muamalah refers to the corpus of Islamic legal rulings governing worldly transactions and social-economic conduct, as distinct from fiqh ibadah, which governs ritual worship. Its foundational principle is one of permissibility: unless a text of the Qur'an or Sunnah, or a valid derivative source, explicitly prohibits a transaction, it is presumed lawful (*al-ashlu fi al-mu'amalati al-ibahah*). Within this permissive framework, however, Islamic jurists have articulated a set of substantive constraints that any valid transaction – and, by extension, any valid certification process – must satisfy [5]. Chief among these are the prohibition of *riba* (usury or unjustified increment), the prohibition of *gharar* (excessive uncertainty or ambiguity capable of provoking dispute), the requirement of mutual consent (*'an taradin*), and the broader ethical demands of *shidq* (truthfulness) and *amanah* (trustworthiness) in dealings.

Halal certification, considered as a muamalah act, functions as a specialised form of *shahadah* (testimony) or *ishhad* (formal attestation): the certifying body attests, on behalf of the consumer, that a product or process conforms to Shariah requirements. Classical fiqh imposes strict conditions on valid testimony, including the competence (*'adalah*) and knowledge (*dhabt*) of the witness [6]. Applied to institutional certification, these conditions translate into requirements for the technical and religious competence of certifying bodies, the auditability of their processes, and their accountability for erroneous or fraudulent certification [7]. Any technological instrument introduced into the certification pipeline must therefore be assessed not only for its technical reliability but for whether it strengthens or weakens the human party's capacity to bear this testimonial responsibility.

Maqashid al-Shariah and the Objectives of Halal Regulation

Contemporary Islamic legal scholarship increasingly situates halal certification within the framework of *maqashid al-shariah* – the higher objectives of Islamic law identified by classical jurists such as al-Ghazali and al-Shatibi as the preservation of religion (*hifz al-din*), life (*hifz al-nafs*), intellect (*hifz al-'aql*), lineage (*hifz al-nasl*), and property (*hifz al-mal*). Halal food and product regulation is most directly connected to the preservation of life and religion: it protects the physical wellbeing of consumers (through the Qur'anic pairing of halal with *tayyib*, or wholesome) and safeguards their capacity to fulfil religious obligations regarding lawful consumption [8]. Framing certification through *maqashid* rather than through narrow, formalistic rule-compliance allows jurists and regulators to evaluate new technologies – including digital ones –

according to whether they substantively advance these protective objectives, rather than merely asking whether a specific classical text mentions them.

Digital Technologies in Halal Certification: State of the Art

A growing body of empirical and conceptual research has examined the application of blockchain, IoT, and artificial intelligence to halal assurance. In a systematic review of the halal food sustainability literature, find that blockchain is consistently identified as a promising instrument for improving the trustworthiness and traceability of halal products across fragmented, multi-actor supply chains, while cautioning that the absence of a universally accepted certifying standard limits its impact [9]. Develop and test a blockchain-based prototype for recording and verifying halal certificates, demonstrating that distributed-ledger architecture can make certification records tamper-resistant and independently verifiable by downstream actors in the supply chain, addressing a core weakness of paper-based systems [10]. in a systematic review of blockchain-based food traceability frameworks more broadly, similarly report consistent gains in transparency and accountability, alongside persistent challenges of interoperability, cost, and regulatory uptake.

Empirical work from Indonesia offers particularly relevant insight into stakeholder attitudes. Karyani et al., combining a quantitative survey of consumers with qualitative interviews and forum discussions involving Indonesia's Halal Product Assurance Organising Agency (BPJPH) and Halal Examination Agencies (LPH), find that both consumers and regulators express favourable intentions toward blockchain-based halal certification, principally because its immutability addresses long-standing concerns about the falsification or unauthorised alteration of certification data [11]. Their findings suggest that trust in digital certification is contingent not merely on the underlying technology but on continued institutional endorsement by recognised religious-regulatory authorities – a point directly relevant to the *fiqh muamalah* requirement that testimony be borne by a competent and accountable party.

Beyond food certification narrowly defined, blockchain applications have also been explored for other Islamic economic instruments, illustrating the wider relevance of distributed-ledger technology to Islamic finance and philanthropy governance; Khan, for instance, proposes a blockchain-based platform for the decentralised collection and distribution of zakat, sharing with halal-certification applications the underlying aim of using immutable, transparent record-keeping to reinforce religiously mandated accountability [12]. Taken together, this literature indicates strong technical feasibility and growing stakeholder acceptance, but it also reveals a recurring gap: most studies approach digital halal certification primarily as an engineering or supply-chain-management problem,

with comparatively limited systematic engagement with the doctrinal categories of fiqh muamalah that determine whether a certification process is not merely efficient but religiously valid.

Standardisation, Fragmentation, and Global Trade

A parallel strand of scholarship addresses the fragmentation of halal standards as a barrier to global trade, independent of the technology used to implement them. Kurnaemi Anita and Nasrullah bin Sapa, analysing Indonesia's halal economic diplomacy from a fiqh muamalah perspective, find that international halal certification standards largely converge at the conceptual level – particularly regarding ritual purity (*taharah*), the requirements of lawful slaughter (halal al-dhabihah), and the precautionary drainage of blood (*istibra'*) – but diverge in their treatment of subsidiary, technically complex questions such as the halal status of enzymes and additives of animal origin, creating friction for exporters who must navigate multiple, sometimes inconsistent, certification regimes. Ali et al., examining Malaysia's halal food export performance through the gravity model of trade, provide econometric evidence that certification and standardisation costs measurably affect halal trade flows, underscoring that standard fragmentation is not merely a doctrinal curiosity but a material determinant of market access [13]. Mansoor extends this analysis into international trade law, arguing that the secular, science-based justificatory framework of the WTO's Technical Barriers to Trade and Sanitary and Phytosanitary Agreements struggles to fully accommodate the religiously grounded rationale of halal requirements, leaving states dependent on narrower exceptions such as the public-morals clause of GATT Article XX. This body of work collectively suggests that digital infrastructure, however sophisticated, addresses the traceability and verification dimension of halal certification but cannot by itself resolve the underlying jurisprudential and institutional fragmentation that constrains cross-border recognition.

Blockchain and the Fiqh Muamalah Standard of Amanah and Shidq

Blockchain technology's defining characteristics – immutability, distributed verification, and cryptographic timestamping – map closely onto the fiqh muamalah requirements of amanah and shidq in the discharge of testimonial responsibility. In classical fiqh, an amanah (trust) is compromised when the trustee has the unilateral ability to alter or conceal the entrusted record without accountability; blockchain, by design, removes precisely this unilateral capacity, since altering a certification record after the fact requires consensus across a distributed network rather than the unchecked action of a single custodian. This structural property is consistent with findings across the empirical literature:

Agung et al. demonstrate that a blockchain-based recording and verification prototype can render halal certificates independently checkable by any party in the supply chain, while Karyani et al. find that Indonesian consumers and regulators alike value this same tamper-resistance as the primary driver of trust in blockchain-based certification.

From a fiqh muamalah standpoint, however, immutability alone does not constitute religious validity. The doctrine of shahadah requires that testimony originate from a party possessing both integrity (*'adalah*) and substantive knowledge (*dhabt*) of what is being attested. A blockchain ledger, considered purely as infrastructure, has neither; it can only faithfully preserve and propagate a determination that a competent human or institutional authority — a certifying body, a Shariah supervisory board, a qualified ulama panel — has already made. The permissibility of blockchain-based certification therefore rests not on the technology itself but on ensuring that the initial entry into the ledger is authorised only by parties who satisfy the classical evidentiary conditions of testimony, and that the chain of custody from raw material to finished product is genuinely, not merely nominally, verified at each stage [14]. Where this condition is met, blockchain functions as a technically superior medium for amanah; where certifying authority is bypassed or automated without adequate human — religious oversight, the underlying gharar (uncertainty as to whether genuine Shariah compliance occurred) is displaced rather than resolved.

IoT, Real-Time Monitoring, and the Avoidance of Gharar

The prohibition of gharar targets transactions and attestations characterised by excessive, avoidable uncertainty — circumstances in which a party cannot reasonably ascertain the true nature, quantity, or condition of what is being transacted or certified. Conventional halal certification, reliant on periodic and often infrequent physical audits, is structurally exposed to a temporal form of gharar: a certificate issued after a single inspection provides limited assurance about conditions before or after that inspection, including the risk of cross-contamination in shared facilities or unauthorised deviation from certified processes between audit cycles. IoT-enabled monitoring — sensors tracking slaughter conditions, storage temperature, transport routes, and facility segregation in real time — directly addresses this temporal gap, converting a static, point-in-time attestation into a continuously verifiable state (Ellahi et al., 2023).

This continuous-monitoring capability can be understood in fiqh terms as reducing gharar by narrowing the interval across which the true halal status of a product remains unverifiable to the certifying authority and, ultimately, to the consumer. It does not, however, eliminate the need for juristic judgment about

what conditions constitute a violation in the first place — a determination that remains a matter of fiqh interpretation (for instance, the threshold at which incidental contact with a non-halal substance triggers istihalah-related questions of substance transformation) rather than a purely sensor-detectable fact. IoT infrastructure is therefore best understood as an evidentiary tool that strengthens the factual basis on which a Shariah authority exercises judgment, not a substitute for that judgment.

Artificial Intelligence, Ijtihad, and the Limits of Automation

Artificial intelligence applications in halal certification — principally anomaly detection in supply-chain data and predictive risk-flagging — raise the most acute fiqh muamalah questions, because they approach, without fully reaching, the domain of substantive religious judgment (ijtihad) that classical fiqh reserves for qualified jurists. An AI system can identify statistical irregularities suggestive of fraud or non-compliance with high efficiency, and in this narrow, investigative role it is functionally analogous to a human auditor's diligence — a practice consistent with, rather than contrary to, the muamalah duty of thorough verification (tabayyun) before attestation. Difficulties arise, however, where AI outputs are treated as dispositive determinations of halal status rather than as inputs to human decision-making, since ijtihad in Islamic jurisprudence is understood as an act requiring moral and legal reasoning, contextual weighing of competing textual and rational evidence, and accountability that cannot, under prevailing fiqh methodology, be delegated to a non-sentient system.

This paper therefore argues for a clear functional boundary: AI and algorithmic tools may permissibly perform the evidentiary and investigative functions of certification — pattern detection, risk scoring, document cross-referencing — but the constitutive act of certifying that a product is halal must remain the exclusive province of a Shariah authority possessing recognised juristic competence, exercised individually or, preferably, through collective ijtihad (*ijtihad jama'i*) within a certification body's *Shariah* supervisory board. This division of labour mirrors the classical fiqh distinction between the marshalling of evidence (bayyinah) and the act of judgment (hukm) itself, which remains reserved to a qualified judge (*qadi*) or, in this institutional context, a qualified certifying scholar.

Smart Contracts and Muamalah Contractual Validity

Smart contracts – self-executing code that automatically enforces predefined conditions – have been proposed as a mechanism for automating aspects of halal-certification compliance, such as automatically flagging or suspending a certificate when monitored conditions (for instance, storage temperature or unauthorised co-mingling with non-halal goods) breach predefined thresholds. Evaluated against the classical requirements for valid contracts (*aqd*) in fiqh muamalah – clarity of subject matter (*ma'qud 'alayh*), lawful cause (*sabab*), and the free and informed consent of contracting parties – smart contracts are broadly compatible in principle, provided that the conditions they encode are themselves derived from valid Shariah determinations and that the parties bound by the contract have genuinely consented to its automated terms rather than having those terms imposed opaquely through proprietary code inaccessible to non-technical stakeholders.

A specific concern raised in the literature on blockchain-enabled halal supply chains is that the encoded logic of a smart contract may embed implicit interpretive choices – for example, a specific threshold for permissible trace contamination – that constitute a form of *ijtihad* in themselves, yet are determined by software developers rather than qualified jurists [15]. To preserve muamalah validity, this paper recommends that the substantive rules encoded in any halal-related smart contract be formally derived from, and periodically reviewed by, a certifying body's Shariah supervisory board, with the technical implementation treated strictly as a mechanism for enforcing a religiously validated rule rather than as an independent source of religious determination.

Cross-Border Harmonisation: What Digitalisation Can and Cannot Solve

Digital infrastructure substantially improves the verifiability and traceability of a halal claim once that claim has been made, but it does not resolve prior disagreement about what the claim should be. The coexistence of Malaysia's predominantly Shafi'i-based JAKIM standard, Indonesia's multi-madhab MUI/BPJP framework, and the deliberately madhab-inclusive OIC/SMIC standard reflects genuine, legitimate juristic diversity (*ikhtilaf*) rather than mere administrative inconsistency [16]. A blockchain record can transparently show, for instance, that an animal was stunned before slaughter or that a given enzyme was derived from a microbial rather than porcine source; it cannot, by itself, determine whether that fact renders the product halal, since that determination depends on which school of fiqh, and which contemporary fatwa council, is applied.

Consequently, digital certification systems designed for global trade should be architected to record the specific fiqh basis and certifying-body identity underlying each determination — rather than presenting a single undifferentiated "halal" flag — so that importing jurisdictions, and consumers with particular madhhab preferences, can assess compliance according to their own applicable standard [17]. Mansoor further demonstrates that, at the level of international trade law, mutual recognition of these differentiated certifications will additionally require institutional coordination between halal-certifying bodies and multilateral frameworks, since the WTO's Technical Barriers to Trade and Sanitary and Phytosanitary disciplines do not automatically accommodate religiously grounded justifications absent such coordination. Digitalisation, in short, is a necessary but not sufficient condition for resolving the trade barriers created by halal-standard fragmentation; it must be paired with sustained institutional harmonisation efforts, such as those pursued through OIC/SMIIC accreditation of national certifying bodies.

Toward a Shariah-Compliant Digital Governance Framework

Synthesising the preceding analysis, this paper proposes a three-layer framework for Shariah-compliant digital halal governance. The first layer, evidentiary infrastructure, comprises blockchain ledgers and IoT sensors that generate a continuous, tamper-resistant record of supply-chain conditions, functioning as a technical strengthening of the amanah owed by supply-chain actors and reducing temporal *gharar*. The second layer, analytical support, comprises AI-based anomaly detection and risk-flagging tools that assist — but do not replace — human review, functioning analogously to the fiqh duty of *tabayyun* (careful verification) prior to attestation. The third and controlling layer, juristic authority, comprises a Shariah supervisory board exercising collective *ijtihad* to determine the substantive rules encoded into any smart contract, to review AI-flagged anomalies, and to retain final, non-delegable authority over the issuance, suspension, or revocation of certification.

Under this framework, digital technology is deliberately positioned as an instrument in service of fiqh muamalah's evidentiary and administrative requirements, rather than as an autonomous substitute for the juristic judgment that gives a halal certificate its religious legitimacy [18]. This positioning addresses the principal gap identified in the literature review — namely, that existing technical studies of halal blockchain and IoT systems have concentrated on efficiency and traceability gains while under-theorising the doctrinal conditions under which such systems remain valid within Islamic commercial law — and offers certifying bodies, regulators such as Indonesia's BPJPH, and international standard-setters such as OIC/SMIIC a principled basis for

evaluating, adopting, and constraining new digital tools as the halal industry continues to scale globally.

Conclusion

This paper has examined the digitalisation of halal certification through the analytical lens of *fiqh muamalah*, arguing that blockchain, IoT, and artificial intelligence can substantially strengthen the evidentiary and administrative foundations of halal assurance – advancing the *muamalah* values of *amanah*, *shidq*, and *gharar* avoidance – but cannot themselves perform the constitutive act of religious certification, which remains, under classical and contemporary *fiqh* methodology alike, a non-delegable function of qualified juristic authority. The study further shows that digital infrastructure, however sophisticated, addresses only the verification dimension of halal trade barriers and leaves untouched the deeper jurisprudential and institutional fragmentation arising from legitimate juristic diversity across national certifying bodies and standard-setting frameworks such as JAKIM, BPJPH, and OIC/SMIIC.

Three implications follow for policy and practice. First, certifying bodies and regulators should adopt digital tools within an explicit governance architecture – of the kind proposed in Section 4.6 – that formally reserves final determinative authority to Shariah supervisory boards, ensuring that efficiency gains do not come at the cost of doctrinal legitimacy. Second, digital certification records intended for cross-border trade should be designed to disclose the specific *fiqh* basis and certifying authority behind each halal determination, enabling differentiated recognition across jurisdictions rather than relying on a single undifferentiated label. Third, technical harmonisation efforts should be pursued in tandem with, rather than as a substitute for, continued institutional and diplomatic coordination among national and international halal-standardisation bodies, since digital transparency cannot by itself resolve substantive juristic disagreement. Future research would benefit from empirical case studies of specific national digital-halal-certification implementations, together with comparative *fiqh* analysis of how different *madhahib* might encode their respective rulings within shared digital infrastructure – an avenue this paper's conceptual framework is intended to support.

Author Contributions

Candra Maulana : Conceptualization, Methodology, Writing – review & editing, Supervision, Project administration. **Deni Mulyadi** : Methodology, Writing – review & editing, Investigation. **Fahmi Arfan** : Conceptualization, Methodology, Writing – review & editing, Investigation.

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Use of artificial intelligence (AI)

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