Virtual Shariah Audit: Challenges and Solutions in the Islamic Finance Industry

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Abstract

The evolution of virtual audits in Islamic finance presents a complex landscape of Shariah compliance challenges requiring industry-matured analysis. A primary concern involves verifying the Shariah conformity and physical existence of commodities as subject matter, adhering to stringent Islamic commercial law. The Shariah governance framework mandates a comprehensive assessment of asset integrity, financial viability, technological readiness, digital auditing, auditor credibility, and inclusivity. These multifaceted criteria introduce hurdles in achieving end-to-end Shariah compliance within a rapid financial ecosystem. This study critically analyzes challenges associated with Shariah virtual auditing, specifically the validity of sale contracts regarding the existence of the subject matter. It highlights operational challenges for auditors inspecting commodities at sites like factories or plants. Auditors face a dilemma: conduct physical site visits, which may expose them to hazards or rely on Shariah pronouncements issued by the commodity provider's Shariah authority. This raises questions regarding the flexibility of Shariah applications in industry practice. Employing a qualitative research methodology including content analysis and thematic analysis, the study evaluates the regulatory frameworks governing virtual audits. The findings suggest that existing virtual audit frameworks within the Islamic finance industry may have significant implications if they do not fully align with Shariah principles. This study contributes possible Shariah solutions through technologies such as robots, virtual reality, and drones for on-site inspections. Addressing these challenges through tailored Shariah-compliant solutions is crucial to ensuring the integrity, transparency, and sustainability of virtual audits in Islamic finance.

Keywords: Shariah Virtual Audit, Islamic Finance Industry, Regulatory Frameworks, Operational Challenges, Robot and Drone

Introduction

Shariah audit presents distinctive challenges, particularly in industrial asset-based financing where verification of the underlying subject matter (*maḥall al-ʿaqd*) is a fundamental Shariah requirement. In high-risk industrial environments such as oil and gas facilities, palm oil facilities, chemical plants, offshore platforms, and hazardous processing zones, physical site

inspections may be unsafe or operationally restricted due to health, safety, and environmental (HSE) considerations. This paper examines how such constraints create a Shariah governance risk rooted in the non-verifiability of subject matter and argues that technology-enabled audit mechanisms including drones, robotics, virtual reality (VR), and real-time remote auditing offer Shariah-compliant solutions. Grounded in Shariah legal principles and contemporary audit literature, the study proposes a hybrid audit model that preserves Shariah assurance while upholding safety and governance integrity.

Virtual audits in Islamic finance have created new Shariah compliance opportunities and concerns. Islamic financial Institutions (IFIs) adopting novel auditing methods make Shariah compliance more complicated. Virtual audits can provide real-time reporting and transparency, but they also present challenges, notably in digital transaction validation and asset appraisal. Besides the virtual audit for plant or physical visit at site, there is another concern on virtual audit for digital assets. Virtual digital asset prices fluctuate, causing financial reporting accuracy issues. Virtual audit frameworks must be implemented in IFIs by accounting experts who are willing and able to adapt. Sanad (2024) examined accounting professionals' metaverse Shariah-compliant financial statement production and flexibility in 2024. According to Bahraini IFI accounting professionals, real-time metaverse reporting may improve financial reporting accuracy and dependability, however digital asset prices differ. The research also showed that IFIs are unprepared for the metaverse and found Shariah governance issues in virtual financial transactions. The report advised AAOIFI to require metaverse Shariah compliance. Isa, et al. (2020) assessed Malaysian Shariah audit processes and stressed their importance in Islamic financial regulatory compliance. A survey of 83 Malaysian Islamic financial institution practitioners showed a thorough awareness of Shariah audit requirements. Insufficient professional training and inconsistent audit frameworks were major issues. Shariah auditor training and industry-wide Shariah compliance require improved education and regulation. Shariah audit frameworks must be integrated with virtual audit technologies to ensure compliance in the changing financial world. This research focuses solely on the pros and cons of virtual audits compared to physical site audits, to mitigate risk exposure that may lead to unnecessary accidents during site visits at plants or facilities.

Auditing in Islamic Financial Institutions (IFIs) presents significant challenges, primarily due to the absence of standardized Shariah auditing frameworks, leading to inconsistencies across various jurisdictions (Bosi & Joy, 2017). The independence of Shariah auditors presents a critical concern, as their close affiliations with the institutions they audit may compromise their objectivity and reliability. The absence of qualified auditors with expertise in both financial principles and Islamic jurisprudence significantly compromises the integrity of the audit process. The lack of clearly established accountability mechanisms worsens these challenges, highlighting the need for a regulatory framework tailored for Shariah audits. Addressing these issues is crucial for upholding the integrity, transparency, and sustainability of Islamic financial reporting in a rapidly evolving industry.

The increasing use of virtual audits in Islamic finance highlights notable deficiencies in comprehending the appropriateness and efficacy of this technology concerning Shariah compliance, as indicated by prior research. The research conducted by Hassan et al. (2024) underscores the insufficient investigation into the usability and investment potential of virtual reality technology within the realm of Islamic finance, pointing to the necessity for deeper

examination of its implications for virtual audits through a Shariah lens. Furthermore, Faza' and Badwan (2024) state alongside Faza' et al. (2023) highlights significant disparities in the functions and skills of internal versus external auditors, which may influence the efficacy of virtual audits in achieving thorough Shariah compliance. According Aldofani & Aldofani (2024) highlights the significance of collaboration among Shariah auditors in risk mitigation; nonetheless, there is an absence of comprehensive examination regarding the practical application of these strategies in virtual audits. Additionally, Salleh et al. (2024) identified a discrepancy between expectations and actual performance in Shariah governance and audit frameworks within Islamic cooperatives, highlighting the necessity to modify these governance principles for virtual audits to improve stakeholder confidence. This study seeks to identify and evaluate the potential and challenges associated with Shariah compliance in virtual audits, while also proposing a framework designed to facilitate consistent compliance within the Islamic financial ecosystem. Consequently, assessing the readiness of IFIs, recognizing any compliance obstacles, and suggesting Shariah-compliant remedies that might improve the efficacy of virtual audit processes in the Islamic banking.

Literature Review
The literature situates Islamic virtual audit within the broader Shariah governance architecture, where Shariah audit functions as a key internal assurance mechanism mandated to ensure continuous Shariah compliance in Islamic financial institutions (IFIs) (Bank Negara Malaysia [BNM], 2019). Under Malaysia's Shariah Governance Framework (SGF) and the Shariah Governance Policy Document (SGPD), Shariah audit is expected to provide independent, risk-focused assurance supported by reliable evidence, a requirement that has become increasingly complex as IFIs adopt digital operations and finance industrial assets located in hazardous environments (BNM, 2010, 2019). While the Shariah audit literature has traditionally focused on governance roles, competence, and structural arrangements (Kamaruddin, 2023; Malaysian Institute of Accountants, 2023), recent audit research highlights how virtual and remote auditing reshapes evidence collection, professional judgement, and assurance quality, particularly when physical access is restricted (Castka et al., 2021; Sian, 2022).

From a Shariah perspective, the core risk in virtual auditing is not merely procedural but epistemic, as restricted access may lead to non-verifiability of the subject matter (maḥall al-ʿaqd), thereby increasing uncertainty (gharar) and Shariah non-compliance risk, especially in asset-based and asset-backed structures. Standards issued by the Accounting and Auditing Organization for Islamic Financial Institutions (AAOIFI) reinforce the centrality of structured Shariah audit processes and evidential sufficiency, providing a normative basis for adapting audit techniques without undermining Shariah assurance (AAOIFI, 2020). Complementary studies on Shariah compliance and information systems further suggest that as transaction execution becomes system-mediated, audit evidence increasingly derives from digital logs, controls, and technology-enabled verification rather than physical inspection alone (Ayedh et al., 2020). Collectively, these strands indicate that Islamic virtual audit represents not a departure from Shariah governance principles but an adaptive response to regulatory, technological, and safety constraints, while also revealing a clear research gap regarding the formalization of technology-enabled evidence such as real-time remote auditing, drones, robotics, and virtual reality as Shariah-compliant substitutes for physical inspection under SGF-aligned assurance frameworks.

The challenges in Shariah auditing have been widely discussed in various studies. According to Kamaruddin et al. (2024), the implementation of Shariah audit practices in Malaysian Shariah-based sectors faces numerous challenges, such as differences in assurance practices and a lack of skilled professionals in the field. Similarly, Arwani (2018) highlighted the scarcity of qualified auditors with dual expertise in Shariah and financial auditing, which impacts the effectiveness of Shariah compliance. Ghani and Rahman (2015) further emphasized the ambiguity in the scope and objectives of Shariah audits in Malaysian Islamic banks, calling for clear guidelines and frameworks to ensure consistent compliance. Additionally, Rashid and Ghazi (2021) identified factors affecting Shariah audit quality in Islamic banking institutions in Pakistan, stressing the importance of internal and external audit functions in maintaining compliance and managing risks.

In terms of governance practices, Khalid (2020) stated the role of audit and governance committees in enhancing internal Shariah audit effectiveness in Bahraini Islamic banks. The study suggests that strong governance structures can improve the credibility of Shariah audits by clearly defining roles, duties, and responsibilities within the audit framework. The findings reinforce the significance of corporate governance in mitigating risks and ensuring transparency in financial operations. The call for comprehensive governance frameworks aligns with the findings of Kamaruddin et al. (2024), who recommended adopting specialized audit programs and enhancing professional competencies to address the uniqueness of Shariah-based financial sectors.

The difficulties of Shariah auditing have been thoroughly examined in several research. Bosi and Joy (2017) conducted an extensive examination of the concerns and challenges confronting Islamic financial institutions, highlighting the necessity for regulatory frameworks and independent Shariah auditors to improve compliance. Puad et al. (2020) assessed the efficacy of current Shariah audit systems from the viewpoint of practitioners, identifying deficiencies in standardization and implementation. Zakaria et al. (2023) examined the feasibility of external Shariah audits, highlighting an increasing demand for proficient auditors and regulatory improvements. Arwani (2018) emphasized the deficiency of auditors possessing dual proficiency in Shariah and financial auditing, which diminishes the credibility of audits in Islamic Financial Institutions (IFIs).

Progress in Shariah audit methodologies amid Industry 4.0 has presented novel prospects and problems. Haqqi (2019) highlighted the significance of technology innovations in transforming Islamic financial audits, promoting the incorporation of digital instruments to fulfill Maqasid Al-Shariah goals. Kamaruddin et al. (2024) emphasized the capacity of automated audit procedures to improve efficiency and precision in Shariah-compliant organizations. Ghani and Rahman (2015) contended that the shift to digital auditing necessitates robust governance frameworks to ensure compliance and uphold stakeholder trust. The results indicate that although technology can aid in achieving Shariah compliance, there is an immediate necessity for regulatory frameworks to oversee its proper application.

The 14th Meeting of the COMCEC Financial Cooperation Working Group (2020) emphasized key issues and challenges associated with the implementation of virtual audits in Islamic financial institutions (IFIs), especially regarding Shariah compliance. The report identifies a significant challenge for countries such as Malaysia: the inconsistency in Shariah resolutions

and the varied backgrounds of Shariah scholars, which may lead to conflicts in the interpretation and application of Shariah rulings. The report indicates that the remuneration structure of Shariah committees may create potential conflicts of interest, thereby affecting the independence and effectiveness of virtual audits. The United Arab Emirates (UAE) exhibits a deficiency in transparency regarding fatwa publication, as noted by COMCEC (2020), alongside a lack of standardized guidelines for the appointment of Shariah Supervisory Board (SSB) members. This situation complicates the integration of virtual audit processes with Shariah governance frameworks. Furthermore, in nations like Indonesia, the report highlights that numerous International Financial Institutions (IFIs) do not possess a legal foundation for creating a specific Shariah governance framework. This situation is exacerbated by Shariah experts frequently holding positions on multiple boards at once, which complicates the establishment of efficient virtual audit mechanisms.

High-risk industrial environments impose strict access controls to protect personnel from exposure to explosions, toxic substances, radiation, or extreme temperatures. While these measures are necessary from an HSE perspective, they directly constrain the Shariah auditor's ability to observe operational realities. Prior audit research demonstrates that the absence of physical access weakens evidence quality and increases reliance on management representations, thereby heightening assurance risk (Sian, 2022; Castka et al., 2021).

From a Shariah governance standpoint, this limitation has deeper implications. The SGF and SGPD require IFIs to ensure that Shariah non-compliance risk is effectively identified, assessed, and mitigated through internal controls, including Shariah audit (BNM, 2010, 2019). Where auditors are unable to verify the operational reality of an asset due to safety restrictions, the effectiveness of Shariah audit and by extension the entire governance framework may be compromised. According to Fatihu et al., (2020) the sole objective of Shariah audit, in addition to conventional audit, is to attest to Shariah compliance.

Based on the above literatures, the significant of this study demonstrates that virtual Shariah audits will face implementation challenges in replacing physical audits at factory sites, as conventional audit practices typically require physical visits to the plant. In *muamalah*, a key principle is ensuring that the goods or subject matter of a transaction truly exist to validate the transaction according to *fiqh*. Therefore, this study proposes possible Shariah-compliant solutions through alternative audit methods, including the use of drones, robots, virtual reality, and virtual audits.

Research Methodology
This study utilizes a qualitative research design with a content analysis methodology to investigate the problems and compliance obligations of virtual auditing in the Islamic financial sector. The data collection would encompass primary sources, including Islamic legal writings such as the Qur'an and Hadith, together with Shariah decisions from authoritative regulatory bodies like SAC of BNM, AAOIFI and IFSB, to delineate the foundational principles of Shariah-compliant auditing. Secondary sources will encompass academic publications, official reports, and policy documents from Islamic financial institutions (IFIs), offering insights into current virtual audit systems and their adherence to Shariah standards. Furthermore, case studies of virtual audit implementations in diverse International Financial Institutions will be examined to discern real obstacles and solutions. The data analysis will employ content analysis to

discern recurring themes concerning Shariah compliance, regulatory deficiencies, and practical aspects of virtual auditing, succeeded by thematic analysis to classify findings into principal categories including contractual validity, transparency, accountability, and ethical considerations, thereby ensuring conformity with Shariah mandates.

To guarantee the authenticity and reliability of findings, triangulation will be performed through expert validation by Shariah scholars and audit experts to verify the alignment of virtual audit techniques with Islamic law. A comparative investigation across several jurisdictions will be conducted to identify shared difficulties and exemplary practices for virtual audits in the Islamic financial sector. The results will be organized into a detailed framework providing directives for IFIs to execute Shariah-compliant virtual audits, while also resolving legislative and operational deficiencies. Additionally, legislative ideas will be presented to improve governance frameworks, facilitating the smooth use of virtual auditing procedures within the Islamic financial ecosystem. This research seeks to enhance the debate on digital change in Islamic finance by offering practical insights for stakeholders, such as regulators, financial institutions, and Shariah advisory boards.

Discussions on Challenges and Solutions of Virtual Shariah Audit
Challenge To Comply with Basic Shariah Requirement of Valid Contract
Referring to BNM (2019) Shariah Governance Policy Document, Shariah audit refers to a function that provides an independent assessment on the quality and effectiveness of the IFI's internal control, risk management systems, governance processes as well as the overall compliance of the IFI's operations, business, affairs and activities with Shariah. BNM in its policy document (2020) interprets that 'Islamic digital banking business' means Islamic banking business as defined in section 2(1) of IFSA which is carried on wholly or almost wholly through digital or electronic means.

To perform virtual Shariah audit at the site, it should observe all shariah requirements inclusive of basic tenets, general terms and conditions. Therefore, according to Usmani, (2000); Muhammad, (2002); Kharofa, (2009); al-Bugho (2009); Jalil et. al (2011); Abd Rahman, (2014); AAOIFI, (2015); BNM, (2017), basic tenets of valid sale contract as follows: First, it has at least two contracting parties, they should possess legal capacity and obtain mutually consent from all parties; Second, to validate subject matter or services it shall meet the following condition; valuable, identifiable, deliverable, existence, owned by owner, has beneficial usage, recognized by custom of people. It can be tangible and intangible asset and valuable from shariah perspective, and Third, Format (*Akad*) literally means fastening, it refers to the practice of joining between two or more things and tying them up together (Abdulaah et al. 2011). Majallat al-Ahkam (2001) as a connection between an offer and acceptance in a lawful manner which has its effect on the subject matter.
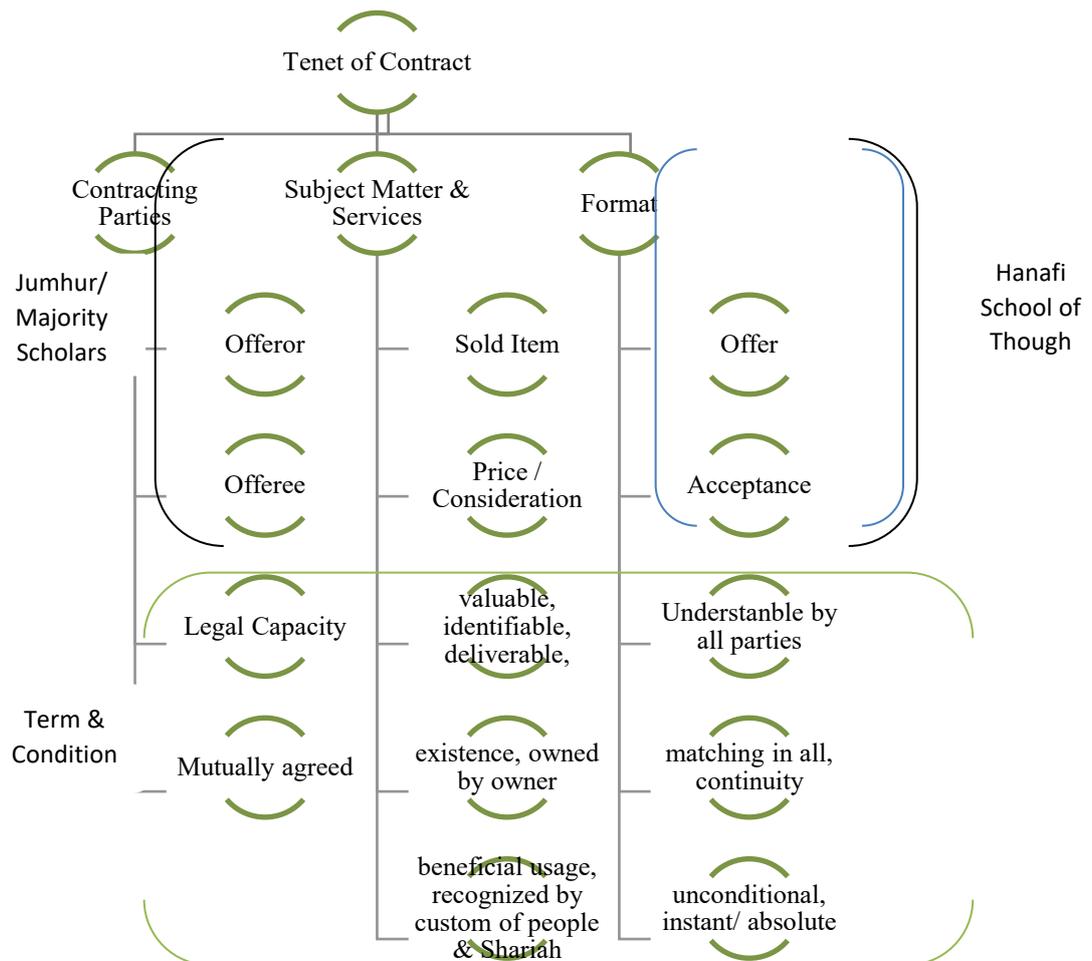
Figure 1. Tenet of Valid Contract
Source: Extract from Usmani (2000); Muhammad (2002); Kharofa (2009); al-Bugho (2009); Jalil et al. (2011); Abd Rahman (2014); AAOIFI (2015); BNM (2017)

Challenge of Non-Verifiability of Subject Matter (Maḥall al-ʿAqd)
Subject matters or services of valid sale contract can be any form of shariah approved products and services. Al-Bugho (2009), Abd. Rahman (2014) determined the condition of valid subject matter as follow; the subject must in existence, valuable in shariah, has benefit, owned by owner or authority, be identified, recognized and known by both parties. Muhammad (2002), added with pure thing and deliverable. BNM (2017) clarified that the possession of the asset shall be in physical possession (*qabd haqiqi*) or constructive possession (*qabd hukmi*).

In Islamic jurisprudence, a valid contract requires that the subject matter be existent, identifiable, and capable of delivery. Classical jurists emphasized *taḥaqquq al-maḥall* as a safeguard against excessive uncertainty (*gharar*). In contemporary industrial finance, the Shariah issue is often not actual non-existence, but rather non-verifiability due to restricted access.

This distinction is crucial. When auditors cannot verify whether an asset exists or is operational, Shariah assurance becomes epistemically weak, potentially undermining certainty (yaqīn) and exposing IFIs to Shariah non-compliance risk. Such a scenario conflicts

with the legal maxim *al-yaqīn lā yazūlu bi al-shakk* and challenges the SGF's objective of ensuring credible Shariah assurance (BNM, 2019).

For virtual Shariah audit assessment on products and services of Islamic banking industry, this research has discovered other challenges such physical inspection constrains, difficulties to streamline with Shariah governance risk and challenge to find Shariah competent auditors.

Challenge to carry out a Physical Inspection

High-risk industrial environments such as oil and gas facilities, palm oil factories, chemical plants, offshore platforms, and radiation-sensitive sites impose stringent access controls to protect personnel from exposure to explosions, toxic substances, extreme temperatures, and other occupational hazards (Hale & Borys, 2013; Hopkins, 2014). While these health, safety, and environmental (HSE) measures are essential, they significantly constrain auditors' ability to conduct physical inspections and directly observe operational realities. Prior auditing literature demonstrates that restricted physical access weakens the richness and reliability of audit evidence, reduces opportunities for informal verification, and increases auditors' dependence on management representations and secondary documentation (Peecher et al., 2013; Power, 1997). Empirical studies on remote and crisis-driven auditing further indicate that the absence of on-site observation heightens assurance risk, challenges professional skepticism, and complicates auditors' assessment of process substance versus formal compliance (Castka et al., 2021; Sian, 2022). In the context of Shariah audit, these constraints are particularly consequential, as the inability to physically verify assets and operations may undermine confidence in the existence and usability of the subject matter (*maḥall al-ʿaqd*), thereby elevating Shariah non-compliance risk under regulatory expectations for effective Shariah governance (Bank Negara Malaysia, 2019; Kamaruddin et al., 2020).

Beyond evidential limitations, restricted physical access in high-risk industrial environments also undermines the auditor's ability to exercise professional judgement through situational awareness, which is critical for understanding operational context, control effectiveness, and behavioral cues during audit fieldwork. Auditing studies emphasize that on-site presence enables auditors to triangulate formal documentation with tacit knowledge gained from observing workflows, spatial arrangements, and informal interactions, elements that are largely absent in restricted or remote settings (Power, 1997; Knechel et al., 2013). When auditors are excluded from processing areas due to safety requirements, audit work becomes increasingly procedural and compliance-oriented, heightening the risk of "form-over-substance" assurance and reducing the capacity to detect hidden control failures or misalignments between documented processes and actual practices (Peecher et al., 2013; Sian, 2022). In the context of Shariah audit, this loss of contextual insight is particularly significant, as Shariah compliance depends not only on contractual form but also on the substantive execution of transactions, asset control, and usufruct delivery, thereby reinforcing the need for alternative verification mechanisms that can restore contextual understanding without compromising safety (Bank Negara Malaysia, 2019).

Challenge to Streamline with Shariah Governance Risk

From a Shariah governance standpoint, this limitation has deeper implications. The SGF and SGPD require IFIs to ensure that Shariah non-compliance risk is effectively identified, assessed, and mitigated through internal controls, including Shariah audit (BNM, 2010, 2019). Where auditors are unable to verify the operational reality of an asset due to safety

restrictions, the effectiveness of Shariah audit and by extension the entire governance framework may be compromised.

Streamlining Shariah governance risk remains a persistent challenge in IFIs, particularly where assurance mechanisms are unable to fully capture operational realities. Recent governance literature highlights that Shariah non-compliance risk often arises not from the absence of formal frameworks, but from gaps in the effective integration of governance structures, internal controls, and audit functions (Abozaid & Khateeb, 2024). Although Shariah governance frameworks are well established in many jurisdictions, their practical implementation is frequently fragmented, resulting in weak coordination between Shariah committees, internal audit, risk management, and operational units. Comparative studies further indicate that differences in national Shariah governance models and regulatory expectations complicate efforts to standardize risk mitigation practices, thereby increasing exposure to Shariah non-compliance risk across institutions and jurisdictions (Fatmawati, 2022).

Empirical research on Shariah auditing and governance practices also reveals that limitations in audit scope and verification capacity undermine the effectiveness of Shariah risk management. When auditors are unable to adequately assess whether Shariah requirements are being fulfilled in substance, governance mechanisms risk becoming compliance-driven rather than assurance-driven (Arwani, 2018). This challenge is exacerbated by resource constraints, skills mismatches, and insufficient integration of Shariah compliance risk into enterprise-wide risk management systems, which collectively weaken the ability of IFIs to proactively identify and address Shariah governance weaknesses (Nurapiah, 2019). As a result, Shariah governance risk is often managed reactively, only after issues are identified, rather than through continuous and preventive assurance mechanisms.

Recent systematic reviews on Islamic banking risk management further underscore that Shariah non-compliance risk remains underdeveloped conceptually and operationally compared to other financial risks, despite its potentially severe reputational and fiduciary consequences (Sohel, 2023). This lack of conceptual clarity and operational streamlining makes it difficult for IFIs to insert Shariah governance risk seamlessly into existing governance and control frameworks. Consequently, scholars argue for a more integrated approach that aligns Shariah governance structures, audit functions, and risk management processes to ensure that Shariah compliance is monitored consistently, effectively, and in a manner that reflects actual operational practices rather than formal documentation alone (Abozaid & Khateeb, 2024).

Challenge to find Shariah Competent Auditors
A critical operational challenge facing the practical implementation of virtual Shariah audit in the Islamic finance industry is the scarcity of Shariah-competent auditors who possess a rare blend of expertise in Islamic jurisprudence, audit methodology, and contemporary financial instruments. Shariah audit inherently requires not only technical auditing skills but also deep understanding of *fiqh muʿāmalāt* (Islamic commercial jurisprudence) and familiarity with industry-specific Shariah standards such as those issued by AAOIFI and regulatory frameworks like Bank Negara Malaysia's SGF and SGPD (Abdul Rahman & Haron, 2020; Hassan & Lewis, 2017). Empirical research indicates that despite regulatory emphasis on internal Shariah audit

functions, many IFIs report difficulty in recruiting and retaining auditors with such dual-domain competence, particularly in contexts where Shariah governance expectations have expanded to include risk management, compliance, and digital assurance (Badawi et al., 2022; Kamaruddin et al., 2020). This competency gap is magnified in virtual environments where auditors must also demonstrate digital literacy, remote evidence evaluation skills, and the ability to interpret technology-mediated data skills that traditional auditor training programmes seldom address (Almagrabi et al., 2023; Syed & Haron, 2021). As a result, the limited pool of Shariah-competent auditors increases the risk of superficial verification, misinterpretation of Shariah control points, and weaker overall assurance outcomes, highlighting the need for tailored education, professional standards, and capacity-building initiatives that integrate Shariah jurisprudence with modern audit and technology competencies.

Proposed Shariah Solutions
Based on the above challenging business case scenario which involved with high-risk industrial environments such as oil and gas facilities, palm oil mills, chemical plants, offshore platforms, and radiation-sensitive sites impose strict access controls to prevent exposure to explosions, toxic substances, extreme temperatures, and other occupational hazards (Hale & Borys, 2013; Hopkins, 2000/2014). These health, safety, and environmental (HSE) measures are essential for worker protection, yet they limit auditors' ability to conduct physical inspections and directly observe operational realities. Auditing scholarship shows that restricted physical access weakens the richness and reliability of audit evidence, reduces opportunities for informal verification, and increases dependence on management representations and secondary documentation (Peecher, Solomon, & Trotman, 2013; Power, 1997). During crisis-driven or remote audit contexts (e.g., pandemic conditions), the absence of on-site observation heightens assurance risk, challenges professional scepticism, and complicates assessments of process substance versus formal compliance (Castka et al., 2021; Al-Ansi, 2022; Wilasitthaa, 2022). In Shariah audit where confidence in the existence, deliverability, and usufruct of the subject matter (*maḥall al-ʿaqd*) is pivotal these constraints may erode *yaqīn* and elevate Shariah non-compliance risk under Malaysia's Shariah governance expectations (BNM, 2019; Puad, Abdullah, & Shafii, 2020).

This study proposes four possible solutions to overcome non-verifiability without compromising HSE. Firstly, we propose a hybrid, risk-based audit framework that establishes *taḥaqquq al-maḥall* (verification of the subject matter) using multi-modal authenticated evidence and independent assurance anchored in AAOIFI's acceptance of constructive possession (*qabd ḥukmī*) and BNM's Shariah Governance Policy (2019). First, audit modality is chosen via a risk-based decision matrix consistent with ISO/IAF guidance for remote audits (ISO 9001 APG, 2020). High-hazard zones warrant hybrid audits; lower-risk contexts may rely on remote methods when evidence integrity can be assured (ISO 9001 APG, 2020).

Second, the framework assembles a multi-modal evidence pack to substitute physical presence with validated virtual presence: (i) secure 360° live walkthroughs and geo-tagged, time-stamped recordings to confirm physical layout and operations (Novelvista, 2025); (ii) drones and robotics for non-destructive inspection of hazardous or inaccessible areas (Nooralishahi et al., 2021; Javaid et al., 2022); (iii) digital twins (VR/AR) that maintain a persistent, inspectable replica of asset condition and configuration to restore situational

awareness (IQ3Connect/ASNT, 2024); and (iv) tamper-evident IoT telemetry logged to a permissioned blockchain for immutable provenance and non-repudiation of asset existence/operation (Kulothungan, 2025; Rani et al., 2025). Collectively, these elements triangulate existence, identifiability, deliverability, and control, satisfying the evidentiary threshold for *qabd ḥukmī* under AAOIFI SS-18 (AAOIFI, n.d.; Rahman, 2020).

Third, to mitigate self-review bias and strengthen public confidence concerns amplified when audits are remote the framework incorporates External Shariah Audit (ESA) for high-materiality transactions and direct reporting to board/audit committees, consistent with SGP 2019's independence and control-function expectations (BNM, 2019). This complements internal Shariah review with independent assurance, addressing the literature's call for stronger standards, competencies, and transparency in Shariah audit (Puad et al., 2020).

Finally, auditor competency is expanded to include remote-audit methods, drone/robotics inspection, digital-twin analysis, and blockchain-IoT verification areas documented as necessary for maintaining scepticism and audit quality in virtual contexts (Nooralishahi et al., 2021; Al-Ansi, 2022; ISO 9001 APG, 2020). This competency uplift counteracts the "form-over-substance" risk that arises when auditors are excluded from processing areas, preserving the professional judgment ordinarily gained from on-site cues, workflow observation, and informal interactions (Power, 1997; Knechel et al., 2013).

In sum, the HSE-driven challenge to physical inspection is addressed by a Shariah-aligned, technology-enabled audit design that restores *yaqīn* through authenticated virtual observation, robust telemetry provenance, and independent assurance. By blending jurisprudential acceptance of *qabd ḥukmī* with modern inspection and evidence technologies, Islamic financial institutions can verify asset existence and deliverability safely and credibly fulfilling Shariah governance objectives even under severe access constraints.

Shariah Justification
The permissibility of virtual and technology-enabled inspection in Shariah audit derives from the broader Shariah objectives of ensuring certainty (*yaqīn*), preventing harm, and avoiding *gharar*. The Qur'an commands believers to avoid conjecture "Avoid much suspicion" (Qur'an 49:12) indicating that contractual dealings must be grounded in clarity and reliable evidence. Digital verification tools such as drones, digital twins, and IoT-based provenance systems strengthen certainty and reduce ambiguity, thus fulfilling this Qur'anic requirement.

Similarly, Shariah prohibits transactions involving excessive uncertainty, as reflected in the Prophet's PUBH prohibition of *bayʿ al-gharar* (Muslim, Hadith no. 1513). When physical inspection of assets in hazardous industrial environments is not possible, technology-enabled methods provide alternative means to ensure clear, verifiable information about asset existence and condition, thereby reducing *gharar* and supporting Shariah-compliant decision-making.

Moreover, Shariah prioritizes the preservation of life. Allah says: "Do not throw yourselves into destruction" (Qur'an 2:195), and the Prophet PBUH established the maxim "No harm and no reciprocating harm" (Ibn Mājah, Hadith no. 2340). These principles justify avoiding dangerous physical inspections in high-risk environments and instead adopting remote

methods that ensure safety. Such technological tools fulfil the maqāṣid of *ḥifẓ al-nafs* (preservation of life) and *ḥifẓ al-māl* (preservation of wealth).

Classical *fiqh* further supports the use of constructive possession (*qabd ḥukmī*), recognised across the schools of Islamic law and codified in AAOIFI Shariah Standard No. 18. Jurists affirm that possession is established when the buyer gains control and the ability to dispose of the asset conditions achievable today through digital access rights, operational logs, blockchain records, and verified telemetry. These forms of modern *qabd ṣināʿī* (technologically enabled possession) are consistent with the legal maxim "Custom (*ʿurf*) is authoritative" and "Hardship begets ease", which allow the use of new methods when necessary to achieve Shariah goals.

Thus, when physical inspection is unsafe or impractical, Shariah not only permits but encourages the adoption of validated remote verification methods that uphold certainty, safety, transparency, and the substantive requirements of Islamic commercial law.

Figure 1: Digital Transformation in Industry for Shariah Audits.
Source: Adapted from Various Industry Visual Audit (2025).

Figure 2: Overview of Global Commodity Trading Platforms
Source: Adapted from Industry data(2025). Represent a non-exhaustive list

Table 1

Challenges of Virtual Shariah Audit & Its Solutions

Challenges	Proposed Shariah Solution
a) Suspicious of Non-Verifiability of Subject Matter (Maḥall al-ʿAqd) This refers to a situation where the existence, condition, or usability of the subject matter of a contract (*maḥall al-ʿaqd*) cannot be confidently confirmed. When auditors doubtful because they cannot directly verify the asset due to restricted access, missing evidence, or safety constraints—it raises a suspicion that the subject matter may not be fully verifiable, which in turn creates *gharar* risk and potential Shariah non-compliance	**Mitigate with Hybrid, Risk-Based Shariah Audit Framework** Ensures *taḥaqquq al-maḥall* through multi-modal authenticated evidence such as virtual walkthroughs, drones, and IoT-based data supported by independent auditor. 1. AAOIFI's acceptance of constructive possession (*qabd ḥukmī*), which permits non-physical verification when control and access are established (AAOIFI) 2. fulfils the requirements of the BNM Shariah Governance Policy 2019 for effective and reliable Shariah oversight (BNM, 2019). 3. Audit modality onsite, hybrid, or remote is selected using a risk-based decision matrix guided by the ISO/IAF Remote Audit Framework (ISO 9001 Auditing Practices Group, 2020).
b) Physical Inspection Constrains Constraints arise when auditors are unable to enter or observe high-risk industrial environments such as oil and gas facilities, palm oil mills, chemical plants, offshore platforms, or radiation-sensitive sites due to strict health, safety, and environmental (HSE) restrictions. These hazards (e.g., explosions, toxic exposure, extreme temperatures) limit auditors' ability to perform on-site verification.	**Technology-Enabled Shariah Audit Solutions** 1. Drones and robotic inspection systems are widely used to access confined spaces and high-risk environments while producing high-resolution, time-stamped evidence. 2. Virtual Reality (VR) and real-time remote auditing further enhance Shariah assurance by enabling immersive, interactive inspection without physical exposure. Through live 360-degree feeds and sensor-integrated visualisation, Shariah auditors can virtually "enter" processing areas while remaining in safe zones such as offices or control rooms.
c) Lack of Regulatory Clarity While regulators like Bank Negara Malaysia have frameworks for audit, virtual auditing remains under-regulated. Many jurisdictions do not mandate External Shariah Audit or set standards for digital audit platforms	**Streamline with Shariah Governance Risk** 1. Regulators should issue guidelines for virtual audit procedures, tools, and cyber-controls. 2. Mandate reporting on virtual-audit readiness in Shariah Governance frameworks.
d) Shortage of Shariah Competent Auditors Evidence shows a shortage of auditors well versed in both Shariah and tech enabled audit methodologies. AAOIFI standards highlight the need for dual expertise.	**Developing Specialized Competency** 1. Design certification programs combining Shariah jurisprudence, digital audit tools, and IT. 2. Collaborate with bodies like AAOIFI, MIA, and universities to incorporate specialized curricula

Motivation and Contribution

Shariah audits in high-risk industrial environments face severe physical access restrictions due to health, safety, and environmental (HSE) controls. These constraints prevent auditors from

verifying the subject matter (*maḥall al-ʿaqd*), creating *gharar* risk and potential Shariah non-compliance. Limited access reduces evidence reliability, challenges scepticism, and increases reliance on management representations. Regulatory gaps in virtual audit standards and a shortage of Shariah-competent auditors further compound the issue. There is an urgent need for a framework that ensures credible Shariah assurance without compromising safety.

This study contributes a Shariah-aligned, technology-enabled audit framework that:

1. Implements a hybrid, risk-based audit model anchored in AAOIFI's *qabd ḥukmī* principle.
2. Utilizes multi-modal evidence (virtual walkthroughs, drones, digital twins, IoT-blockchain telemetry).
3. Strengthens governance via External Shariah Audit and regulatory guidance.
4. Develops specialized auditor competency combining Shariah and digital audit skills.

Conclusion

This study shows that virtual Shariah audits, though challenged by restricted physical access and risks of non-verifiable *maḥall al-ʿaqd*, can remain robust through a hybrid, risk-based framework that employs multi-modal digital evidence and independent assurance aligned with AAOIFI's *qabd ḥukmī* and the BNM Shariah Governance Policy. By integrating tools such as drones, robotic, virtual walkthroughs, digital twins and IoT telemetry, the model strengthens *taḥaqquq al-maḥall*, reduces *gharar*, and protects auditor safety. The research contributes by (1) extending Shariah scholarship through a modern application of constructive possession, (2) offering a practical, ISO-aligned methodology for virtual Shariah audits, and (3) providing Islamic financial institutions with a feasible, Shariah-compliant solution to mitigate SNC risk in high-hazard environments.

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