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(AIJBES)**www.gaexcellence.com/aijbess**ARTIFICIAL INTELLIGENCE IN DIGITAL TAKAFUL
GOVERNANCE: A PATH TOWARD SHARIAH-
COMPLIANT AI FRAMEWORKS**

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Abstract:

The digital transformation of the Takaful sector has created new opportunities for the use of Artificial Intelligence (AI), blockchain, and smart contracts, which have been gaining traction in the industry to enhance efficiency, transparency, and financial inclusion. This paper addresses the implications of AI on the governance of digital Takaful in relation to Shariah compliance and regulation in Malaysia. The purpose of this study is to examine the governance implications of AI in digital Takaful, with a particular focus on the role of AI in ensuring Shariah compliance and the regulatory landscape in Malaysia. This study adopts a narrative literature review to highlight the governance implications of AI in digital Takaful, particularly in relation to Shariah compliance and the regulatory landscape in Malaysia. Thematic analysis was conducted on the literature that was published mainly from 2020 to 2026 to highlight five key themes: AI for operational efficiency, blockchain and smart contracts, Shariah governance and algorithmic compliance, risks of implementing AI, and financial inclusion through Micro Takaful. These findings indicate the potential of AI to improve underwriting, claims management, fraud detection, customer engagement, and customer onboarding in the digital realm. However, the use of such technologies brings governance challenges relating to algorithmic bias,

black-boxing of models, data governance, cybersecurity, and auditability of automated decision-making. Based on these observations, the study suggests an integrated governance model in terms of participation of Takaful Operators, Shariah Committees, technology governance roles and regulators' supervision. This may play a role in the development of Shariah-compliant AI systems, providing transparency, accountability, and safeguarding the participants.

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Artificial Intelligence, Digital Takaful, Shariah Governance, Fintech, Shariah Compliance



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Introduction

The Takaful industry is a Shariah-compliant alternative to conventional insurance, based on the concepts of mutual assistance (*ta'awun*), charity (*tabarru'*) and a collective risk-sharing model. Takaful operators in Malaysia are regulated under the Islamic Financial Services Act 2013 (IFSA 2013) and must abide by Shariah principles (Islamic Financial Services Act 2013).

Digital transformation has become a growing phenomenon in financial services and is affecting Islamic financial services to a large extent. AI can be used to assist with process automation, data analysis, customer interactions, risk management, fraud detection, and compliance (Sarea et al., 2021; Azwar et al., 2026). In the context of Takaful operations, automation can be used during underwriting, claims settlement, customer service, compliance, and other operations. Jafar and Qadri (2026) specifically look at automation and the use of AI in the Takaful industry, such as underwriting, claim processing, compliance, predictive modelling, and customer service. Additionally, a recent bibliometric study using the Scopus-indexed literature reveals three key clusters in the evolution of AI in Islamic finance, namely AI, blockchain, and Shariah governance (Azwar et al., 2026).

The use of AI in Islamic finance not only poses governance challenges related to technology. The conditions of Shariah and accountability, transparency, fairness, data governance, and human oversight need to be taken into consideration when looking at AI decision-making. As cited by Sarea et al. (2021), AI can contribute to improving the efficiency, transparency, and service delivery in Islamic finance, and additional research indicates that there are Shariah governance frameworks that can be used to supervise AI in line with the Islamic legal and ethical principles (Zafar & Ali, 2026).

Blockchain can be used alongside AI to provide audit trails and automated execution, complementing the capabilities of AI technology in this digital world. In the insurance industry, researchers have studied blockchain smart contracts for their potential to enhance transparency,

automate claims processing, and minimize fraudulent claims (Zulaikha et al., 2024). Likewise, the Takaful industry has also been a subject of a promising use for blockchain smart contracts, as they facilitate claim processing, enhance efficiency, and mitigate fraudulent claims.

While there is significant research in the field of Islamic finance using AI, the work on AI governance in Islamic Takaful is comparatively less. There is growing interest in the use of AI in related literature, but more research is needed to align technological governance, Shariah governance, regulatory considerations, and operational risk management into a cohesive Takaful framework.

Specifically, there is a need to explore the governance implications of autonomous or semi-autonomous AI systems. The growing body of research on Shariah governance of AI highlights the need to incorporate Shariah principles across the entire AI lifecycle, from data collection to model building, deployment, monitoring, and review (Zafar & Ali, 2026). Hence, this study looks into how AI can be used in digital Takaful, the governance issues, and regulatory aspects that arise in this context, and the necessary requirements for a Shariah-compliant governance structure.

Methodology

The approach used in this study is the narrative literature review method, which aims to combine research in the fields of AI, Takaful, Islamic finance, blockchain, Shariah governance, and financial technology. The literature identification process was directed towards academic literature and authoritative regulatory sources. Database and publisher platforms were used for the literature search. Keywords used were Artificial Intelligence (AI), Takaful, Digital Takaful, Shariah Governance, Islamic Finance, Blockchain, and Smart Contracts.

Peer-reviewed journal articles, book chapters from academia, and official regulatory documents were the primary sources of information included in the review, with the bulk of these published from 2020 to 2026. The use of earlier sources of authority has been maintained where these sources offer key legal and regulatory underpinnings, such as the Islamic Financial Services Act 2013 and the Bank Negara Malaysia Policy Document on Shariah Governance. References were placed into focus for those that could be cited from Scopus-indexed and/or publisher/indexing documents, and references on Malaysian regulatory claims were established from official documents by Bank Negara Malaysia. The literature was classified into five themes, namely operational automation, blockchain and smart contracts, Shariah governance, AI-related risks, and financial inclusion, using thematic analysis.

Results and Discussion

The thematic analysis identifies five major themes concerning AI governance in digital Takaful.

Theme 1: Automation and Operational Efficiency in Underwriting and Claims Processing

AI can play a role in the modernisation of Takaful underwriting and claims administration. Financial institutions can use machine learning and data analytics tools to analyze massive amounts of data, detect patterns, aid in risk assessment, and enhance operational efficiency (Sarea et al., 2021; Azwar et al., 2026). Jafar & Qadri (2026) delve in detail into the issue of automation and AI in the Takaful industry. Their discussion ranges from applications such as

underwriting, claims processing, compliance, predictive modelling, expert systems, decision-support systems, data mining, to chatbots. These applications can help minimize repetitive administrative tasks and enable more customer-friendly services.

AI could also help with fraud detection and compliance tasks. AI applications have been considered in Islamic finance in relation to customer interaction, Takaful, Anti-Money Laundering (AML)/ Countering the Financing of Terrorism (CFT), Know Your Customer (KYC), fraud detection, risk management, and regulatory technology (Sarea et al., 2021; Azwar et al., 2026).

Implication: Automation of operations could lead to better efficiency, but Takaful operators will need to be able to ensure that the implementation of automation will not undermine participant protection or Shariah requirements, and therefore will need to ensure proper cybersecurity, data governance, human oversight, and staff competencies.

Theme 2: Blockchain Technology and Smart Contracts for Transparency and Trust.

Transparency in the administration of Takaful funds is crucial for maintaining participants' trust and the integrity of the participant risk fund. Blockchain technology can facilitate a distributed and tamper-proof record of transactions, and smart contracts can automate transactions once certain conditions have been met (Zulaikha et al., 2024). Smart contracts are a key part of this architecture by automating workflows based on specific conditions, which enhances the automation of claims submission, review, analysis, and payment (Wang et al., 2023).

Zulaikha et al. (2024) analyzed the application of blockchain smart contracts in insurance and Takaful, and found that it offers advantages such as transparency, reduced fraudulent claims, enhanced stakeholder relationships, and an automated claim payment process. For instance, if a smart contract system is implemented that has been preprogrammed with the conditions that must be met to trigger a Takaful benefit, it could then automatically execute the benefit after the predetermined conditions have been met. With parametric Takaful, objective external information may be used to trigger a payment based on a contractual condition.

The use of automation, however, does not make a product Shariah-compliant by itself. The logic of the smart contracts should be compatible with the contractual terms and the applicable Shariah requirements. For this reason, to ensure that the Shariah is well overseen, the contractual logic, execution conditions, and associated controls must be appropriately reviewed (Zulkepli et al., 2023; Mohamed Shaarani et al., 2023).

Theme 3: Shariah Governance and Algorithmic Compliance Challenges

Incorporating AI into Takaful presents unique issues of Shariah governance. Consistency with applicable Shariah compliance must be adhered to in automated decisions, which must be consistent with applicable Shariah provisions, such as avoiding elements of *riba*, excessive *gharar*, and *maysir* where applicable to the underlying transaction and product structure.

While AI has the potential to enhance automation and operational efficiency in Islamic finance, it also introduces Shariah-related challenges that need to be addressed in the context of existing Shariah principles and governance structures (Zulkepli, 2025). Some AI systems are not transparent, posing a major problem. When the grounds of the algorithmic decision are not

sufficiently explained, Shariah reviewers, internal auditors, regulators, and involved stakeholders may encounter challenges in the algorithmic decision-making process (Weber et al., 2024; Černevičienė & Kabašinskas, 2024).

Zafar and Ali (2026) suggest a framework for Shariah governance of AI systems that includes Islamic legal and ethical principles at every stage of the AI lifecycle, from data gathering to AI deployment and monitoring. Their system emphasizes dual governance structures with both Shariah and an AI governance structure. The institutional framework for the inclusion of Shariah considerations in Islamic financial institutions' (IFIs) business and risk strategies is provided by Bank Negara Malaysia's Policy Document on Shariah Governance in Malaysia (Bank Negara Malaysia, 2019).

Implication: Technical review, explainability, algorithmic accountability, data governance, and continuous monitoring should be incorporated into Shariah governance to a greater extent.

Theme 4: Risks and Challenges of AI Implementation

There are operational, technical, ethical, and regulatory risks associated with implementing AI. One important consideration is algorithmic bias. If a training dataset is incomplete, inaccurate, or not representative of the population, the AI system may generate systematic differences for various groups. Islamic digital finance, on the other hand, also points to cybersecurity, data governance, institutional readiness, and regulatory compliance as other key risks that require governance, but in relation to AI (Zulkepli, et. al, 2026). Transparency and explainability of AI is also crucial. Zafar and Ali (2026) highlight transparency, accountability, and proactive risk mitigation in a lifecycle approach to Shariah governance of Generative AI.

Other issues that the takaful operators need to consider include compliance with data privacy, cybersecurity, model risk, third-party technology risk, and automated decisions accountability. There may be other barriers, such as financial resources and access to specialised technical expertise, for smaller operators.

Implication: AI adoption should be done gradually and introduce corresponding tests, documentation, risk assessments, human involvement, cybersecurity measures, and regulatory interaction prior to adoption on a large scale.

Theme 5: Financial Inclusion and Micro Takaful

Digital technologies can contribute to financial inclusion by lowering the administrative costs and making financial services more accessible. AI-powered onboarding, automated verification, digital identity solutions, and data-driven product design can assist Takaful operators in providing services to underserved communities. In addition, the findings from the Malaysian insurance and Takaful sector reveal that information quality, service quality, system quality, effort expectancy, and perceived risk are key factors that are relevant to the users' acceptance of fintech services (Hassan et al., 2023).

For Micro Takaful, digitization of distribution channels and automated claims procedures could alleviate issues related to distance, administrative expense, and availability of traditional financial-service infrastructure. However, a digital product design needs to be accessible and understandable by people of varying digital and financial capacity. In terms of Maqasid al-

Shariah, technology-enabled Takaful can help achieve the goals of Maqasid as long as the products being utilized and the manner of their implementation comply with Shariah requirements.

Implication: Digital Takaful efforts need to be technologically scalable, accessible, provide adequate protection, disclose, and be governed by Shariah.

Recommendation

The following procedures are suggested:

1. Create governance frameworks based on Shariah-by-design principles: Regulators and industry groups must create guidelines on Shariah-by-design principles in the architecture and development of AI systems.
2. Train Shariah oversight staff: Provide Shariah scholars, Shariah officers, and internal auditors with AI, data analytics, algorithmic accountability, and smart-contract technologies training.
3. Improve digital infrastructure: Takaful operators should create secure and interoperable digital infrastructure with appropriate identity, data-management, and cyber-security controls.
4. Ensure participant access to digital platforms: Digital Takaful platforms should be accessible and understandable for all participants with varying digital literacy levels.
5. Further study into emerging use cases of AI: Future research should explore Generative AI, Large Language Models, explainable AI, autonomous systems and the implications for Takaful operations and Shariah governance.

Conclusion

The narrative literature review method was used in this study to analyse the application of Artificial Intelligence in the governance of digital Takaful and the potential routes for the implementation of AI in a Shariah-compliant framework. There are signs in the literature that AI can be used to aid in operational automation, customer service, risk management, compliance, and other functions of Takaful. The use of blockchain and smart contracts could provide additional benefits for transparency, automated transactions, and claims processing. Concurrently, AI poses governance issues such as explainability, algorithmic bias, accountability, data governance, cybersecurity, and Shariah compliance. Hence, recent research stresses the integration of Shariah principles throughout the entire AI lifecycle and setting up proper institutional governance mechanisms. AI governance for Malaysia should be built on the current legal and institutional framework as outlined in IFSA 2013, Bank Negara Malaysia's Shariah governance requirements, and existing financial technology regulatory mechanisms.

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