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# Artificial Intelligence and Shariah Governance in Islamic Finance: Institutional Design, Value Creation, and Risk Management

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## Abstract

*This study examines the institutional, ethical, and governance implications of artificial intelligence (AI) adoption in Islamic finance, with a particular focus on Shariah governance, value creation, and risk management. Drawing on a qualitative and conceptual analysis of existing literature, regulatory standards, and Shariah governance frameworks, the paper conceptualises AI not merely as a technological innovation but as a governance-transforming force within Shariah-compliant financial systems. The findings indicate that AI integration necessitates a reconfiguration of traditional Shariah governance structures, moving from ex post product approval toward continuous, lifecycle-based oversight that embeds Shariah principles into algorithm design, deployment, and monitoring. In terms of value creation, AI enhances operational efficiency, risk assessment, and financial inclusion while supporting ethical objectives aligned with maqasid al-shariah, particularly when explainable and human-in-the-loop models are adopted. However, these benefits are contingent on robust governance arrangements that prevent the erosion of moral judgment and institutional accountability. The analysis further reveals that AI introduces new Shariah-specific risks, including algorithmic opacity, data bias, and accountability gaps, which may undermine transparency, fairness, and trust if left unaddressed. Overall, the study demonstrates that the impact of AI in Islamic finance is fundamentally mediated by governance quality. It contributes a holistic institutional perspective that integrates Shariah governance, AI ethics, and risk management, offering policy-relevant insights for regulators, Shariah scholars, and practitioners seeking to balance technological innovation with ethical and religious integrity.*

## Keywords

*Artificial Intelligence, Shariah Governance, Islamic Finance, Institutional Design, Risk Management*

## Introduction

The rapid advancement of artificial intelligence (AI) is transforming the global financial system by reshaping decision-making processes, operational efficiency, and risk management practices. AI-driven technologies—including machine learning, predictive analytics, natural language processing, and generative AI—are increasingly embedded in core financial activities such as credit scoring, fraud detection, portfolio management, and regulatory compliance (Costello *et al*., 2020; Punniyamoorthy & Sridevi, 2016; Bartáková *et al*., 2025). Empirical evidence from conventional finance suggests that AI adoption can enhance financial performance, improve predictive accuracy, and reduce earnings volatility by strengthening internal governance and information processing capabilities (Gyau *et al*., 2024; Sheng & Shao, 2025; Cheng *et al*., 2025). At the same time, concerns have emerged regarding algorithmic opacity, bias, accountability, and systemic risk, particularly when AI systems are deployed without robust governance frameworks (Ozili, 2024; Fan & Zhao, 2025).

Within this evolving landscape, Islamic finance faces a distinct and complex challenge. Unlike conventional financial systems, Islamic finance operates under Shariah principles that prohibit *riba* (interest), *gharar* (excessive uncertainty), and *maysir* (speculation), while emphasising ethical conduct, transparency, and social justice. Shariah governance—typically institutionalised through Shariah Supervisory Boards (SSBs), internal Shariah compliance units, and regulatory oversight—plays a central role in ensuring that financial innovation remains aligned with Islamic ethical and legal norms (Sarea *et al*., 2021; Abozaid & Khateeb, 2024). The integration of AI into Islamic finance therefore raises fundamental questions about whether algorithmic decision-making can be reconciled with Shariah requirements of accountability, explainability, and moral responsibility (Rabbani *et al*., 2021; Najib *et al*., 2025).

Recent scholarship has begun to explore the application of AI in Islamic finance, highlighting both its transformative potential and its governance-related risks. Studies indicate that AI can significantly enhance operational efficiency, customer profiling, credit risk assessment, and compliance monitoring in Islamic banking and takaful institutions (Sarea & Elsayed, 2021; Shalhoob, 2025). Explainable AI (XAI) models, such as LightGBM and transformer-based architectures, have been proposed as tools to improve transparency and mitigate Shariah compliance risks in lending and investment decisions (Li *et al*., 2025; Hicham & Habbat, 2025). Moreover, emerging applications of AI in robo-advisory services and fatwa formulation suggest a growing role for algorithmic systems in areas traditionally governed by human scholarly judgement (Priantina *et al*., 2025; Kharisma *et al*., 2025).

However, the literature also underscores significant limitations. Algorithmic opacity, data bias, and the delegation of moral reasoning to machines pose risks that are particularly acute in Islamic finance, where compliance is not merely legalistic but normative and ethical in nature (Iqbal *et al*., 2025; Arsyad *et al*., 2025). Shariah boards themselves express mixed views on AI adoption, recognising its efficiency gains while questioning its ability to internalise maqasid al-shariah—the higher objectives of Islamic law—such as justice, welfare, and harm prevention (Haridan *et al*.,

2023; Najib *et al*., 2025). These concerns are amplified by the rise of generative AI, which introduces new uncertainties related to autonomy, authorship, and decision legitimacy within Islamic financial institutions (Zafar & Ali, 2025; Khan, 2025).

Despite a growing body of conceptual and empirical work, there remains a notable gap in the literature regarding the institutional design of Shariah governance in an AI-driven environment. Existing studies tend to focus either on technical applications of AI or on ethical concerns in isolation, without systematically examining how AI reshapes governance structures, value creation mechanisms, and risk management frameworks in Islamic finance (Manneh *et al*., 2025; Mughoyaroh *et al*., 2025). In particular, limited attention has been given to how AI interacts with Shariah governance institutions, alters accountability relationships between humans and machines, and redefines the boundaries of permissible automation under Islamic law.

This study addresses this gap by offering a governance-oriented and institutional analysis of AI adoption in Islamic finance. Rather than evaluating AI solely as a technological tool, the paper conceptualises AI as a governance-transforming force that affects how value is created, monitored, and protected within Shariah-compliant financial systems. By integrating insights from AI governance, Islamic finance theory, and risk management literature, the study advances a more holistic understanding of AI–Shariah interactions. In doing so, it aligns with recent calls for dynamic and prescriptive governance frameworks that can accommodate technological innovation while safeguarding Shariah principles (Khan, 2025; Zafar & Ali, 2025).

The primary objective of this paper is to examine how AI influences Shariah governance in Islamic finance through three interrelated dimensions: institutional design, value creation, and risk management. Specifically, the study seeks to understand how AI reshapes Shariah governance structures, enhances or constrains ethical value creation, and introduces new categories of operational, compliance, and systemic risk. By adopting a conceptual and analytical approach, the paper contributes to both academic debates and policy discussions on responsible AI integration in Islamic financial institutions.

Guided by this objective, the study addresses the following research questions; how does the integration of artificial intelligence reshape Shariah governance structures and institutional design in Islamic finance? How does AI contribute to value creation in Islamic financial institutions while remaining consistent with Shariah principles? what new governance and risk management challenges emerge from the use of AI and generative AI in Shariah-compliant finance? By addressing these questions, the paper aims to provide a theoretically grounded framework for understanding AI-driven transformation in Islamic finance, offering insights for regulators, Shariah scholars, and industry practitioners seeking to balance innovation, compliance, and ethical integrity.

## Literature review

The rapid advancement of artificial intelligence (AI) has fundamentally reshaped financial decision-making by enabling automated credit assessment, risk modelling, and performance optimisation. In conventional finance, AI-based systems have demonstrated superior predictive capacity compared to traditional statistical approaches, particularly in credit risk analysis and default prediction (Punniyamoorthy & Sridevi, 2016; Costello *et al*., 2020). Recent studies employing machine learning and explainable AI models show that algorithmic lending tools can enhance accuracy, reduce human bias, and improve operational efficiency when integrated with institutional oversight (Li *et al*., 2025; Gyau *et al*., 2024). These technological gains, however, are accompanied by governance challenges related to opacity, data bias, and algorithmic accountability, raising concerns over ethical decision-making and institutional legitimacy (Bartáková *et al*., 2025).

Governance and institutional theories provide a critical framework for understanding how AI affects organisational behaviour and financial stability. Empirical evidence suggests that AI adoption contributes positively to firm performance and earnings stability when embedded within strong internal governance and regulatory environments (Sheng & Shao, 2025; Cheng *et al*., 2025). Conversely, weak governance structures may exacerbate systemic risk, financial crime, and moral hazard, particularly in highly automated decision-making contexts (Fan & Zhao, 2025; Ozili, 2024). These findings underscore that AI is not value-neutral; rather, its economic and risk implications are shaped by institutional design, regulatory norms, and ethical oversight mechanisms.

Within Islamic finance, the integration of AI introduces both transformative opportunities and distinctive challenges. Islamic financial institutions (IFIs) operate under Shariah principles that prohibit riba, excessive uncertainty (gharar), and unethical speculation, while promoting fairness, transparency, and social welfare. Prior research highlights that AI can enhance Shariah-compliant banking by automating compliance screening, improving contract verification, and supporting smart contract implementation (Rahim *et al*., 2018; Sarea *et al*., 2021). More recent studies indicate that AI-driven tools may strengthen financial inclusion and operational efficiency in Islamic finance, provided that Shariah requirements are embedded into algorithmic design and governance processes (Iqbal *et al*., 2025; Manneh *et al*., 2025).

Despite these benefits, the literature consistently cautions that AI systems pose significant Shariah governance risks due to their opacity and reliance on probabilistic decision-making. Shariah boards require explainability, traceability, and human accountability to assess the permissibility of financial contracts and institutional practices (Haridan *et al*., 2023). Algorithmic decision-making that lacks transparency may undermine the epistemological foundations of Shariah rulings, particularly when outcomes cannot be clearly justified in accordance with Islamic legal reasoning (Arsyad *et al*., 2025; Najib *et al*., 2025). As a result, scholars increasingly argue that AI adoption in Islamic finance must be accompanied by enhanced Shariah governance frameworks rather than merely technical compliance tools.

Recent contributions extend Shariah governance theory by incorporating AI-specific oversight mechanisms. Proposals for Shariah governance standards on generative AI emphasise the need for human-in-the-loop decision-making, ethical safeguards, and continuous auditability of AI models (Zafar & Ali, 2025; Khan, 2025). Empirical insights further suggest that AI-assisted fatwa formulation and compliance monitoring can improve consistency and efficiency, but only when scholarly authority and institutional accountability remain central (Priantina *et al*., 2025). These perspectives align with maqasid al-shariah, which frames value creation not solely in financial terms but in relation to justice, social welfare, and risk prevention.

Overall, the existing literature reveals a fragmented understanding of AI in Islamic finance, often treating technology, governance, and Shariah compliance as separate domains. While studies acknowledge the potential of AI to enhance value creation and risk management, few provide an integrated institutional perspective that explains how AI governance and Shariah oversight jointly shape outcomes in Islamic financial institutions. This gap highlights the need for a holistic framework that conceptualises AI not merely as a technological tool, but as an institutional force that reconfigures governance structures, value creation mechanisms, and risk management practices within Shariah-compliant finance.

## Methods

This study adopts a qualitative and conceptual research approach to examine the role of artificial intelligence in shaping Shariah governance, institutional design, value creation, and risk management within Islamic finance. A qualitative methodology is appropriate given the normative, ethical, and governance-oriented nature of Shariah compliance, which cannot be sufficiently analysed through purely quantitative or technical performance metrics. Rather than testing causal relationships, the study aims to develop a theoretically informed understanding of how AI interacts with Shariah governance frameworks and institutional oversight mechanisms in Islamic financial institutions.

The analysis is grounded in secondary qualitative data obtained through a systematic review of peer-reviewed literature on artificial intelligence in finance, Islamic finance governance, ethical AI, and financial regulation. In addition, the study examines Shariah governance standards, regulatory guidance, and emerging policy-oriented contributions addressing AI oversight, generative AI, and automated decision-making in Islamic finance. These sources enable contextualisation of AI adoption within existing Shariah supervisory structures and regulatory environments.

Data are analysed thematically to identify recurring patterns related to institutional governance design, Shariah compliance mechanisms, value creation processes, and risk management challenges arising from AI integration. By synthesising insights from technology governance theory, Islamic jurisprudence, and financial regulation, the methodology provides an integrated conceptual foundation for understanding AI-enabled Islamic finance and for informing future empirical research and policy development.

## Result and Discussion

### *Institutional Design of AI-Enabled Shariah Governance*

The findings indicate that the integration of artificial intelligence into Islamic finance necessitates a fundamental reconfiguration of Shariah governance structures. Traditional institutional designs—largely centred on periodic product approval by Shariah Supervisory Boards (SSBs)—are increasingly inadequate for overseeing AI-driven systems that operate continuously, learn dynamically, and influence decision-making across the financial value chain. AI applications in credit scoring, robo-advisory services, compliance monitoring, and contract screening introduce algorithmic layers that challenge conventional notions of Shariah accountability (Arsyad *et al*., 2025; Manneh *et al*., 2025).

The results suggest a shift toward hybrid governance architectures that embed Shariah oversight throughout the AI lifecycle, from model design and data selection to deployment and post-implementation monitoring. Scholars increasingly advocate for interdisciplinary governance models integrating Shariah scholars, data scientists, legal experts, and risk managers to ensure that AI systems reflect Islamic ethical principles while remaining operationally effective (Zafar & Ali, 2025; Khan, 2025). This institutional evolution aligns with *Maqasid al-Shariah* perspectives, which emphasise safeguarding justice, transparency, and human dignity in financial decision-making (Najib *et al*., 2025).

However, institutional capacity constraints remain a significant challenge. Empirical insights from Shariah board perceptions reveal concerns regarding limited technical literacy among scholars and asymmetries of information between management and Shariah oversight bodies (Haridan *et al*., 2023). Without adequate institutional support and regulatory clarity, AI governance risks devolving into symbolic compliance, where systems appear Shariah-aligned without substantive ethical oversight. These findings underscore that institutional design is a determining factor in whether AI enhances or undermines Shariah governance credibility.

*Figure 1. Institutional Design of AI-Enabled Shariah Governance in Islamic Finance*

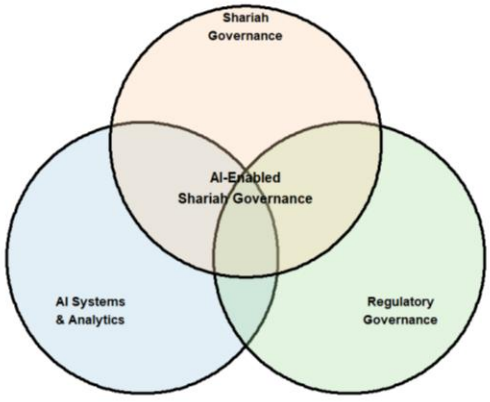

Figure 1 illustrates the institutional design of AI-enabled Shariah governance in Islamic finance, highlighting the intersection of AI systems, regulatory governance, and Shariah oversight. Their convergence enables ethical value creation, risk management, and accountability, ensuring that AI adoption remains compliant with *Maqasid al-Shariah* and financial stability objectives.

### *AI-Driven Value Creation in Islamic Finance*

From a value creation perspective, the results demonstrate that AI contributes meaningfully to Islamic finance by enhancing efficiency, accuracy, and scalability while supporting ethical financial objectives when properly governed. AI-based credit assessment and risk prediction models improve borrower screening and reduce information asymmetry, thereby enabling Islamic financial institutions to extend financing more inclusively and sustainably (Costello *et al*., 2020; Li *et al*., 2025). These efficiencies are particularly relevant for Islamic banks and fintech platforms seeking to balance commercial viability with social finance objectives.

Moreover, AI-supported decision-making enhances financial performance and operational resilience by optimising internal processes and strengthening governance mechanisms (Gyau *et al*., 2024; Cheng *et al*., 2025). When aligned with Shariah principles, AI facilitates value creation beyond profit maximisation, supporting ethical allocation of capital, improved customer protection, and enhanced transparency. Studies highlight that explainable AI models are especially valuable in Islamic finance, as they allow Shariah boards to interrogate decision logic and ensure compliance with prohibitions against *gharar* (excessive uncertainty) and *zulm* (injustice) (Bartáková *et al*., 2025; Sarea *et al*., 2021).

Nevertheless, the findings also reveal limits to AI-driven value creation. Over-reliance on algorithmic optimisation may marginalise qualitative ethical judgment and reduce complex moral considerations to technical parameters. Generative AI systems, while offering innovation potential, raise concerns regarding authorship of decisions, responsibility attribution, and the erosion of human agency in Shariah deliberation (Priantina *et al*., 2025). Thus, value creation in Islamic finance emerges not as an automatic outcome of AI adoption, but as a governance-contingent process shaped by institutional choices and ethical safeguards.

*Figure 2. AI-Driven Value Creation in Islamic Finance*


Figure 2 illustrates a hierarchical pyramid of AI-driven value creation in Islamic finance. Foundational AI analytics enable robust risk management and governance, which enhances financial performance and stability. These mechanisms collectively support ethical, Shariah-compliant outcomes aligned with *Maqasid al-Shariah* and sustainable financial inclusion.

## *Risk Management and Shariah Compliance Challenges*

Risk management emerges as a central domain where AI both mitigates and introduces new vulnerabilities in Islamic finance. On one hand, AI adoption is associated with reduced earnings volatility, improved fraud detection, and enhanced monitoring of compliance breaches, contributing to financial stability and institutional resilience (Sheng & Shao, 2025; Ozili, 2024). AI-driven surveillance systems enable continuous oversight of transactions, strengthening Shariah audit functions and reducing the likelihood of non-compliant activities going undetected (Shalhoob, 2025).

On the other hand, the findings highlight significant Shariah-specific risks associated with AI integration. Algorithmic opacity, data bias, and model risk threaten core Islamic finance principles of transparency, fairness, and accountability (Fan & Zhao, 2025). If training data reflect systemic biases or conventional financial norms, AI systems may inadvertently generate outcomes inconsistent with Shariah objectives, particularly in areas such as credit exclusion or automated

contract structuring. This risk is compounded by the potential for regulatory lag, where governance frameworks fail to keep pace with technological innovation (Rabbani *et al*., 2021).

The analysis further reveals that effective risk management requires embedding Shariah governance into AI risk frameworks rather than treating compliance as a post hoc validation exercise. Dynamic, prescriptive AI governance standards—tailored specifically to Islamic finance—are increasingly viewed as essential to managing both technological and ethical risks (Khan, 2025; Zafar & Ali, 2025). Without such integration, AI may amplify systemic and reputational risks, undermining trust in Islamic financial institutions and compromising their social legitimacy.

Overall, the results demonstrate that AI's impact on Islamic finance is fundamentally mediated by governance quality. Institutional design determines oversight capacity, value creation depends on ethical alignment, and risk management hinges on adaptive Shariah governance. Together, these findings reinforce the central argument that AI in Islamic finance must be governed not merely as a technology, but as a socio-ethical system embedded within Shariah-based institutional frameworks.

*Figure 3. Management vs Shariah Compliance Challenges in AI-Enabled Islamic Finance*

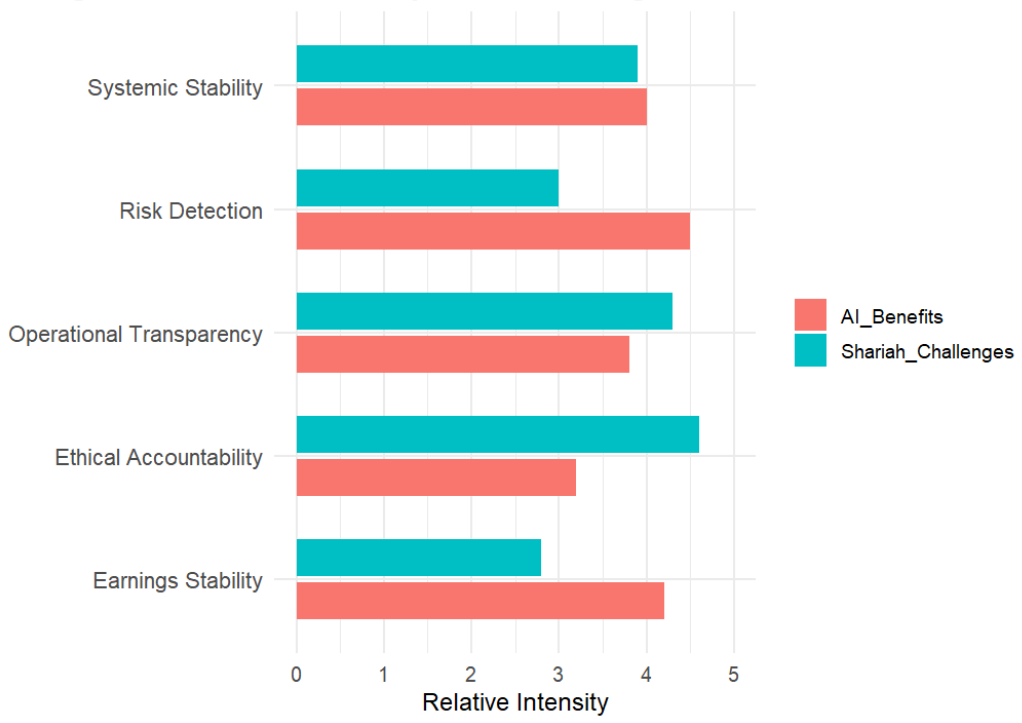


Figure 3 illustrates the dual impact of artificial intelligence on risk management and Shariah compliance in Islamic finance. While AI enhances risk detection, earnings stability, and systemic monitoring through advanced analytics and automation, it simultaneously introduces governance challenges related to transparency, ethical accountability, and

decision explainability. The comparison highlights that Shariah compliance risks intensify in areas where algorithmic opacity and delegated decision-making weaken human oversight. The figure underscores that the net benefits of AI depend on robust Shariah governance frameworks that embed accountability, explainability, and *maqasid al-shariah* principles throughout the AI lifecycle, rather than relying solely on technical efficiency gains.

## Conclusion

This study has examined the growing integration of artificial intelligence within Islamic finance through the lens of Shariah governance, institutional design, value creation, and risk management. As AI-driven technologies increasingly shape financial decision-making, the findings demonstrate that Islamic finance faces a distinctive governance challenge: harnessing the efficiency and analytical power of AI while preserving Shariah principles grounded in ethical accountability, transparency, and social justice. Unlike conventional financial systems, where algorithmic optimisation may be evaluated primarily on performance outcomes, Islamic finance requires that technological innovation remain normatively aligned with Islamic legal and moral frameworks.

The analysis reveals that AI fundamentally reshapes Shariah governance structures by challenging traditional supervisory models that rely on periodic human review and ex post compliance checks. AI systems operate continuously, adapt dynamically, and influence multiple layers of financial intermediation, rendering conventional Shariah oversight insufficient. As a result, institutional design emerges as a critical determinant of governance effectiveness. The study highlights the need for hybrid and interdisciplinary governance architectures in which Shariah scholars, data scientists, risk managers, and regulators jointly oversee AI systems across their entire lifecycle. Without such institutional adaptation, AI adoption risks devolving into symbolic compliance, undermining both Shariah credibility and institutional legitimacy.

In terms of value creation, the findings indicate that AI offers substantial benefits for Islamic financial institutions when embedded within robust governance frameworks. AI enhances operational efficiency, credit assessment accuracy, compliance monitoring, and scalability, thereby supporting financial inclusion and ethical capital allocation. Importantly, AI-driven value creation in Islamic finance extends beyond profitability to encompass broader *maqasid al-shariah* objectives, including fairness, transparency, and protection of stakeholders. However, the study also underscores that value creation is not an automatic outcome of AI adoption. Over-reliance on algorithmic decision-making, particularly in the context of generative AI, may marginalise human moral reasoning and dilute scholarly authority in Shariah deliberation. Thus, ethical value creation remains contingent on governance choices rather than technological capability alone.

Risk management represents the third and most complex dimension of AI integration in Islamic finance. While AI strengthens fraud detection, reduces earnings volatility, and enhances continuous compliance monitoring, it simultaneously introduces new categories of Shariah-

specific risk. Algorithmic opacity, biased data, and model risk threaten core Islamic finance principles of justice, accountability, and transparency. The findings emphasise that treating Shariah compliance as a post hoc validation exercise is inadequate in AI-driven environments. Instead, Shariah governance must be embedded directly into AI risk frameworks, supported by dynamic, prescriptive governance standards tailored to Islamic finance.

The policy and practical implications of this study are significant. Regulators, Shariah scholars, and industry practitioners must collaborate to develop AI governance frameworks that are both technologically informed and Shariah-grounded. Capacity building for Shariah boards, regulatory clarity on AI oversight, and standardisation of governance practices are essential to prevent regulatory lag and ethical erosion. Aligning AI governance with *maqasid al-shariah* provides a principled pathway for reconciling innovation with Islamic ethical commitments.

In conclusion, AI should be understood not merely as a technological tool but as a governance-transforming force within Islamic finance. When governed effectively, AI has the potential to enhance ethical value creation, institutional resilience, and social legitimacy. When governance is weak or fragmented, however, AI risks amplifying systemic, ethical, and reputational vulnerabilities. The future of AI in Islamic finance therefore depends not on technological sophistication alone, but on the strength, adaptability, and moral clarity of Shariah governance institutions.

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