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Artificial Intelligence in Indonesian Islamic Banking: Ethical Implications and Shariah Governance

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ABSTRACT

Introduction: *The growing use of Artificial Intelligence (AI) in Indonesian Islamic banking creates both opportunities and tensions. On one side, it can improve operational performance, strengthen risk management, and broaden financial inclusion; on the other, it raises serious ethical, regulatory, and Shariah-compliance concerns. This study examines how AI adoption, Shariah ethical values, ethical consequences, and Shariah governance are interrelated in Indonesia's Islamic banking industry.*

Methods: *The study builds a mediated model based on the Technology Acceptance Model (TAM), the Maqashid Shariah framework, and Responsible AI principles. It tests the model using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 3. The sample comprises of 364 professionals from Islamic banks in Indonesia, selected through purposive sampling.*

Results: *The results indicate that AI adoption and Shariah ethical principles each have a significant positive effect on ethical implications. Ethical implications, in turn, strongly and positively affect the effectiveness of Shariah governance. Moreover, ethical implications fully mediate the links between AI adoption and Shariah governance and between Shariah ethical principles and Shariah governance.*

Conclusion and suggestion: *The study highlights that ethical factors must be central to AI implementation in Islamic financial institutions. Shariah governance structures need to adapt to AI-related risks, such as algorithmic bias, data privacy violations, and the lack of transparency in "black box" systems, while still serving Maqashid Shariah goals. This research adds to the literature on Islamic fintech governance and provides practical policy guidance for regulators, Shariah supervisory boards, and Islamic banking practitioners. AI can benefit Islamic finance, but only when its use is carefully aligned with Shariah ethical and legal requirements.*

Keywords: *Artificial Intelligence, Islamic Banking, Ethical Implications, Shariah Governance, Maqashid Shariah*

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INTRODUCTION

The global financial landscape is undergoing a profound digital transformation, driven by rapid advances in Artificial Intelligence (AI). In Indonesia, the world's largest Muslim-majority nation, the Islamic banking sector stands at a critical juncture. The industry has grown significantly, with assets exceeding USD 100 billion and accounting for approximately 9% of the national banking sector as of 2023 (Islamic Financial Services Board, 2025). This growth is intrinsically linked to the nation's ambition to become a global hub for Islamic finance. However, the competitive pressures of the digital age, coupled with evolving customer expectations, have compelled Islamic banks to embrace technological innovation with unprecedented urgency. AI technologies, including machine learning, natural language processing, robotic process automation, and predictive analytics offer transformative potential for Islamic financial institutions. These technologies can enhance operational efficiency, improve risk management through sophisticated fraud detection and credit scoring, personalize customer service via AI-driven chatbots, and facilitate real-time decision-making (Bas et al., 2025). For an industry built on ethical principles and social justice, AI offers an opportunity to advance these objectives by expanding financial access for underserved Muslim populations and enabling more precise, Shariah-compliant product development.

However, integrating AI into Islamic finance comes with significant challenges. The very nature of AI its complexity, opacity, and reliance on vast datasets raises fundamental questions about Shariah compliance, data ethics, and regulatory readiness (Bas et al., 2025). Unlike conventional finance, where the primary concerns may be efficiency and profitability, Islamic finance operates within a normative framework that mandates adherence to Maqashid Shariah (the objectives of Islamic law). These objectives include preserving religion (din), life (nafs), intellect (aql), progeny (nasl), and wealth (maal), alongside the overarching principles of justice (al-'adl), transparency, and public interest (maslahah). Deploying AI in this context introduces novel ethical dilemmas. Algorithmic bias, for instance, can perpetuate and even amplify systemic inequalities, directly contravening the Islamic mandate for justice. The "black box" nature of many AI models creates a form of gharar (excessive uncertainty), as stakeholders, including Shariah supervisory boards, may be unable to understand or explain how decisions are reached (Kannike & Fahm, 2025). Data privacy concerns are paramount, given the sensitive nature of financial information and the Islamic emphasis on amanah (trust). Furthermore, the potential displacement of human judgment by automated systems raises questions about taklif (moral responsibility) and the role of human agency in financial decision-making (Mulyono & Edris, 2025).

These challenges unfold against an evolving regulatory landscape. The Indonesian Financial Services Authority (OJK) has taken significant steps to strengthen Shariah governance through Regulation No. 2 of 2024 (Otoritas Jasa Keuangan Republik Indonesia, 2024b), which mandates a comprehensive Shariah governance framework encompassing the duties of the Shariah Supervisory Board (DPS), Shariah compliance functions, Shariah risk management, internal Shariah audit, and external Shariah review. While this regulation provides a robust foundation, it still lacks specific, detailed guidance on the unique governance

challenges posed by AI (Bas et al., 2025). This study addresses this critical gap by empirically examining the interrelationships between AI adoption, Shariah ethical principles, ethical implications, and Shariah governance in Indonesian Islamic banks. By developing and testing a mediated model, it seeks to answer the following research questions: (1) How does the adoption of AI influence the ethical implications perceived within Islamic banks? (2) To what extent do Shariah ethical principles shape these ethical implications? (3) How do these ethical implications, in turn, affect the effectiveness of Shariah governance? (4) Do ethical implications mediate the relationship between AI adoption, Shariah ethical principles, and Shariah governance? The findings are expected to provide valuable insights for policymakers, regulators, and practitioners, offering a roadmap for the ethical and Shariah-compliant integration of AI into Islamic finance

LITERATURE REVIEW

The adoption of AI in banking is fundamentally a question of technology acceptance. The Technology Acceptance Model (TAM), first proposed by Davis in 1989, posits that an individual's intention to use a technology depend on two primary beliefs: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). In Islamic banking, TAM has been extended to incorporate sector specific factor, such as Shariah compliance, trust, and privacy concerns. Research indicates that trust is a pivotal element in the adoption of AI-driven services, particularly chatbots, within Islamic banking. A study by Nazri, (2024) found that while the potential of chatbot technology in Indonesian Islamic banking is considerable, adoption remains relatively low, with trust emerging as a crucial mediator between perceived security and the intention to adopt. This is consistent with the broader TAM literature, which recognizes trust as a key antecedent of technology acceptance in high-risk or high-uncertainty environments. Furthermore, the literature suggests that adopting Islamic fintech is positively influenced by Sharia compliance and Task–Technology Fit. An extended TAM study on AI-based e-ijarah applications in Indonesia showed that user satisfaction and continued adoption are significantly driven by the perception that the technology aligns with Sharia principles and is well-suited to the task at hand (Hamadou et al., 2024). This highlights that in Islamic banking, a technology’s usefulness is not purely functional but also inextricably linked to its ethical and religious legitimacy. Recent studies have also used comprehensive models, such as the Expectation Confirmation Model (ECM), integrated with AI Suka, antecedents, to explain customer satisfaction and acceptance of AI-based services in Indonesian Islamic banking (Mi Alnaser et al., 2023). The findings consistently affirm that both cognitive beliefs (usefulness, ease of use) and affective factors (trust, satisfaction) are essential for successful AI adoption.

Ethical Implications of AI in Islamic Finance

The ethical implications of AI in finance are multifaceted, encompassing concerns related to privacy, algorithmic bias, transparency, accountability, and fairness. In the Islamic finance context, these are not merely regulatory or reputational issues; they are fundamentally Shariah-compliance issues. Privacy and Data Protection: AI systems’ reliance on vast amounts of data, including sensitive personal and financial information, raises profound privacy concerns. In Islam, preserving one's wealth (hifz al-mal) and the sanctity of private life are paramount. Unauthorized use or disclosure of personal data breaches amanah (trust), which is a core ethical principle. As Amiri, (2025) notes, ethical AI design in Islamic finance must prioritize protecting of users' personal data and preventing financial harm or exploitation, especially in matters related to inheritance and consumer safety. Algorithmic Bias and

Fairness: AI models can inherit and amplify biases in their training data. In finance, this can lead to discriminatory lending practices, unfair credit scoring, or exclusionary product offerings. The Quranic injunction to "stand out firmly for justice" (Surah An-Nisa, 4:135) makes it incumbent upon Islamic financial institutions to ensure that their AI systems do not perpetuate injustice (zulm). Responsible AI literature emphasizes fairness as a core principle, but operationalizing fairness in complex AI systems remains a significant challenge. A systematic literature review by Bas et al., (2025) highlighted algorithmic bias as one of the most pressing concerns for AI integration in Indonesian Islamic banking.

Transparency and Accountability: The "black box" problem of many advanced AI models where the internal decision-making logic is opaque even to the developers poses a significant challenge to accountability. This opacity can be construed as a form of gharar (excessive uncertainty), which Islamic transactions prohibit. Stakeholders, including customers and Shariah supervisors, have a right to understand the basis of decisions that affect them. The Responsible AI framework, articulated through principles such as FATES (Fairness, Accountability, Transparency, Equity, and Safety), provides a useful lens for assessing these challenges (Loucif et al., 2025). In the Islamic context, transparency (shafafiyyah) and accountability (mas'uliyyah) are not just best practices but religious obligations. that Islamic banks widely use performance measures for public interest and fairness. With communication technology and regulatory compliance, the use of Maqasid al-Shari'ah-based performance measures as Islamic banks' performance driver becomes more potent. The Ethical Permissibility of AI: Beyond specific concerns, a broader jurisprudential question remains about the permissibility of AI in Islamic financial decision-making. A study by Mulyono & Edris, (2025) analyzed this from a Maqasid al-Shariah perspective, concluding that AI is permissible provided it does not contravene the principles of honesty and justice and continues to prioritize humans as moral supervisors and legal subjects (taklif). This suggests a nuanced position: AI can help achieve Maqashid Shariah, but it cannot replace human moral agency.

Shariah Governance in Indonesian Islamic Banking

Shariah governance refers to the set of institutional and organizational arrangements through which Islamic financial institutions ensure compliance with Shariah principles. In Indonesia, POJK No. 2 of 2024 primarily defines the regulatory framework for shariah governance, superseding earlier regulations and establishing a more comprehensive framework (Otoritas Jasa Keuangan Republik Indonesia, 2024a). The key components of Shariah governance under this regulation include:

1. Duties and Responsibilities of the Shariah Supervisory Board (DPS): The DPS ensures that all products, services, and operational activities comply with Shariah principles. The DPS must possess the necessary qualifications, competence, and integrity.
2. Shariah Compliance Function: This function ensures that all bank activities comply with Shariah principles, as determined by the DPS. It involves ex-ante and ex-post reviews of products, transactions, and processes.
3. Shariah Risk Management Function: This function identifies, measures, monitors, and controls Shariah non-compliance risks. With the advent of AI, this function must expand to include AI-specific risks , such as algorithmic bias and data privacy breaches.
4. Internal Shariah Audit Function: This function provides independent assurance on the effectiveness of the Shariah governance framework and the adequacy of internal controls related to Shariah compliance.

5. External Shariah Review: This involves an independent assessment of the bank's Shariah governance practices by an external party.

The literature has also developed indices to measure the quality of Shariah governance. The Shari'ah Governance Practices Index (SGPi), developed by Nazmi & Hassan, (2024), provides a quantitative tool for assessing Shariah governance across dimensions such as the Board of Directors, Shariah Committee, Management, Shariah-compliant Functions, and the Institution itself. Similarly, the Islamic Governance Score (IG-Score) by Meskovic et al., (2024) measures the quality of Islamic governance through indicators such as the existence of a Shariah Supervisory Board, its size, qualifications, and meeting frequency. However, the existing regulatory frameworks and governance indices were not designed with AI in mind. As Bas et al. (2025) note, a significant gap exists in AI-specific guidelines within current Islamic finance governance structures.

Maqashid Shariah as an Ethical Framework

Maqashid Shariah provides a comprehensive ethical framework for evaluating AI integration in Islamic finance. As articulated by classical scholars such as Al-Ghazali and contemporary scholars like (Ibrahim & Ali, 2026), the objectives of Shariah can be categorized into three broad areas: educating the individual (tahdzib al-fard), establishing justice (iqamah al-adl), and preserving public interest (maslahah).

In the context of AI, Maqashid Shariah offers several key criteria for ethical assessment:

a. Preservation of Religion (Hifz al-Din): AI systems must not be used in ways that contradict Islamic teachings or facilitate prohibited activities (e.g., riba, gharar, gambling).
b. Preservation of Life (Hifz al-Nafs): AI-driven decisions must not endanger the physical or psychological well-being of customers or employees.
c. Preservation of Intellect (Hifz al-Aql): AI must not be used to manipulate or degrade human reasoning. Instead, it should augment human intelligence and support informed decision-making.
d. Preservation of Progeny (Hifz al-Nasl): AI systems must not discriminate against families or undermine the stability of family units.
e. Preservation of Wealth (Hifz al-Mal): AI must protect and enhance wealth in a just and transparent manner, free from exploitation and fraud.
f. Justice (Iqamah al-Adl): AI must be designed and deployed to promote justice, ensuring fair treatment for all customers regardless of background.
g. Maslahah: AI should serve the broader public interest, contributing to social welfare and economic development.

The literature on AI and Maqashid Shariah suggests a proactive approach (Farid et al., 2025) argues that AI design must prioritize protecting users' personal data and preventing financial harm, to align with Maqasid principles. (Mulyono & Edris, 2025) emphasize that human responsibility (taklif) must remain central, with AI serving as a tool to assist, not replace, human moral judgment.

Theoretical Framework and Hypotheses

Integrating the literature on TAM, Maqashid Shariah, Responsible AI, and Shariah governance, this study proposes a mediated model with four core variables: AI Adoption (X1), Shariah Ethical Principles (X2), Ethical Implications (M), and Shariah Governance (Y).

AI Adoption (X1): Drawing from TAM, this construct is measured through indicators including Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Awareness of AI, Subjective Norms, Perceived Trust, Perceived Risk, Attitude towards AI, and Behavioral Intention (Davis,

2014; Hamadou et al., 2024). Shariah Ethical Principles (X2): This construct reflects the extent to which the bank's AI practices align with Maqashid Shariah. Indicators include the protection of religion, life, intellect, progeny, and wealth, alongside the principles of justice (iqamah al-adl), maslahah, and the individual education (tahdzib al-fard) ((Sulistiyah & Hidayah, 2026). Ethical Implications (M): This mediating construct captures the perceived ethical consequences of AI deployment. It is operationalized through indicators derived from the Responsible AI framework (FATES), including privacy protection, absence of algorithmic bias, transparency, accountability, fairness, safety, inclusivity, and user impact (Loucif et al., 2025).

Shariah Governance (Y): The dependent variable is the effectiveness of Shariah governance. Indicators are drawn from POJK No. 2/2024 and the Shari'ah Governance Practices Index (SGPi), including the effectiveness of the DPS, Shariah compliance function, Shariah risk management, internal Shariah audit, external Shariah review, transparency and disclosure, DPS meeting frequency, and DPS qualifications and reputation ((Otoritas Jasa Keuangan Republik Indonesia, 2024b); (Nazmi & Hassan, 2024). Based on this framework, the following hypotheses are proposed

H1: AI Adoption has a positive and significant effect on Ethical Implications.

H2: Shariah Ethical Principles have a positive and significant effect on Ethical Implications.

H3: Ethical Implications have a positive and significant effect on Shariah Governance.

H4: Ethical Implications mediate the effect of AI Adoption on Shariah Governance.

H5: Ethical Implications mediate the effect of Shariah Ethical Principles on Shariah Governance.

METHOD

This study employs a quantitative, cross-sectional survey design to test the proposed hypotheses. This quantitative approach is appropriate for examining relationships between latent constructs and generalizing findings to the broader population of Islamic banking professionals in Indonesia. The unit of analysis is the individual professional working within Islamic banks, including those in management, Shariah compliance, risk management, IT, and Shariah supervisory roles. The target population comprises professionals working in Islamic commercial banks (Bank Umum Syariah) and Islamic business units (Unit Usaha Syariah) in Indonesia. According to data from the Financial Services Authority (OJK), 20 Islamic commercial banks and 21 Islamic business units operated in Indonesia as of 2024. The total number of professionals in these institutions is estimated to be in the thousands.

A purposive sampling technique was used to ensure that respondents had the requisite knowledge and experience regarding AI adoption and Shariah governance. The inclusion criteria were: (1) current employment in an Islamic bank in Indonesia, (2) minimum of one year of work experience in the Islamic banking sector, and (3) familiarity with AI technologies or Shariah governance practices. This approach aligns with other recent SEM-PLS studies in Islamic banking, such as by Rahayu et al., (2025), which used purposive sampling to select 120 customers of Islamic banks in Medan. The sample size was determined based on PLS SEM recommendations. Following the "10 times rule" heuristic, the minimum sample size should be ten times the number of indicators in the most complex construct. With 8 indicators per construct, a minimum of 80 respondents would be required. However, to enhance statistical power and ensure robust results, a larger sample was targeted. We distributed 400 questionnaires and obtained 364 valid responses, yielding a response rate of 72.8%. This sample size is comparable to that used by (Mbaidin et al, 2024), who analyzed data from 364

professionals in a similar PLS-SEM study on AI integration and governance standards in Islamic banking.

Data were collected through an online self-administered questionnaire distributed via email and professional networking platforms over a period of three months (Mai-July 2026). The questionnaire consisted of five sections: (1) demographic information, (2) AI Adoption, (3) Shariah Ethical Principles, (4) Ethical Implications, and (5) Shariah Governance. All measurement items were adapted from established scales in the literature. Before full-scale distribution, we conducted a pilot study was conducted with 30 respondents to assess instrument's the clarity, reliability, and validity. Based on the pilot results, the researchers made minor wording refinements to a few items. All constructs were measured using multi-item scales adapted from previous studies. All items used a five-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). AI Adoption (X1): Eight items adapted from the extended TAM literature ((Davis, 2014); (Hamadou et al., 2024). Sample items include: "The use of AI in my bank improves my work efficiency" (Perceived Usefulness) and "I find it easy to use the AI systems in my bank" (Perceived Ease of Use).

Shariah Ethical Principles (X2): Eight items developed based on the Maqashid Shariah framework (Ismawati & Wahyuningsih, 2025); (Alshaer, 2024). Sample items include: "AI systems in my bank are used in a way that is free from riba" (Preservation of Religion) and "AI systems in my bank promote justice in transactions" (Justice). Ethical Implications (M): Eight items adapted from the Responsible AI framework ((Loucif et al., 2025); (Ali et al., 2025). Sample items include: "AI systems in my bank protect customer data privacy" (Privacy) and "AI decisions in my bank are free from bias" (Fairness). Shariah Governance (Y): Eight items developed based on POJK No. 2/2024 and the SGPi ((Otoritas Jasa Keuangan Republik Indonesia, 2024b); (Nazmi & Hassan, 2024). Sample items include: "The Shariah Supervisory Board in my bank has the necessary qualifications and competence" and "My bank has an effective Shariah risk management function that addresses AI-related risks."

The data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 3. PLS-SEM is particularly suitable for this study for several reasons. First, it is a variance-based method that is appropriate for predictive and exploratory research. Second, it can handle complex models with multiple constructs and indicators without requiring a large sample size or normally distributed data. Third, it is well-suited for testing mediation hypotheses, as it allows for the simultaneous estimation of direct and indirect effects. The analysis followed the two-step approach recommended by Hair et al., (2019): Assessment of the Measurement Model: The measurement model was assessed for internal consistency reliability, convergent validity, and discriminant validity. Internal consistency was evaluated using Cronbach's alpha and composite reliability (CR), with values above 0.70 considered acceptable. Convergent validity was assessed through indicator loadings (above 0.70) and the Average Variance Extracted (AVE), with values above 0.50 indicating adequate convergent validity. Discriminant validity was assessed using the Fornell-Larcker criterion and the Heterotrait-Monotrait (HTMT) ratio, with HTMT values below 0.85 (or 0.90 for conceptually similar constructs) indicating satisfactory discriminant validity.

Assessment of the Structural Model: The structural model was assessed for collinearity (VIF values below 5), path coefficients (significance and direction), coefficient of determination (R^2), effect size (f^2), and predictive relevance (Q^2). We tested the significance of path coefficients using bootstrapping with 5,000 sub samples. We conducted mediation analysis using bootstrapping to estimate the indirect effects and confidence intervals, as recommended (Coutts & Hayes, 2023). This study adhered to established ethical guidelines for research involving human participants. All respondents provided informed consent and

were assured of anonymity and confidentiality. Participation was voluntary, and respondents could withdraw at any time. The data were used solely for academic purposes and were stored securely.

RESULT AND ANALYSIS

The demographic profile of the 364 respondents reveals a diverse and experienced group of Islamic banking professionals. In terms by gender, 58.2% were male and 41.8% were female. Most respondents (42.3%) were aged 35-44 years, followed by those aged 25–34 years (31.6%). Regarding education, 61.5% held a bachelor's degree, 28.0% held a master's degree, and 4.1% held a doctoral degree. The remaining 6.4% held diplomas or other qualifications. In terms of job roles, 34.9% were staff members, 26.4% were supervisors, 22.8% were managers, and 6.3% were directors or members of the Shariah Supervisory Board. The remaining 9.6% held other positions. The distribution of work experience was as follows: 18.4% had less than 3 years, 35.7% had 4–6 years, 29.7% had 7–10 years, and 16.2% had more than 10 years of experience in Islamic banking.

Table 1. Demographic profile of respondents in the research "Artificial Intelligence in Indonesian Islamic Banking: Ethical Implications and Shariah Governance

Variable	Category	Frequency	Percentage (%)
Gender	Male	212	58,2
	Female	152	41,8
		364	100,0
Age	<25	46	12,6
	25-34 years	115	31,6
	35-44 years	154	42,3
	45-54 years	49	13,5
		364	100,0
Education	Diploma	23	6,4
	Bachelor	224	61,5
	Master	102	28,0
	Doctor	15	4,1
		364	100,0
Job role	Staff	127	34,9
	Supervisor	96	26,4
	Manager	83	22,8
	Vice President	23	6,3
	Others	35	9,6
		364	100,0
Experience	< 3 years	67	18,4
	4-6 years	130	35,7
	7-10years	108	29,7
	>10 years	59	16,2
		364	100,0

Source: Authors (2026)

The measurement model was assessed for reliability and validity. All indicator loadings exceeded the recommended threshold of 0.70, with values ranging from 0.721 to 0.894. This indicates that each indicator contributes significantly to its respective construct. Internal consistency reliability was confirmed with Cronbach's alpha values ranging from 0.738 to 0.909, and composite reliability (CR) values ranging from 0.883 to 0.926. Both sets of values exceed the 0.70 threshold, indicating high reliability.

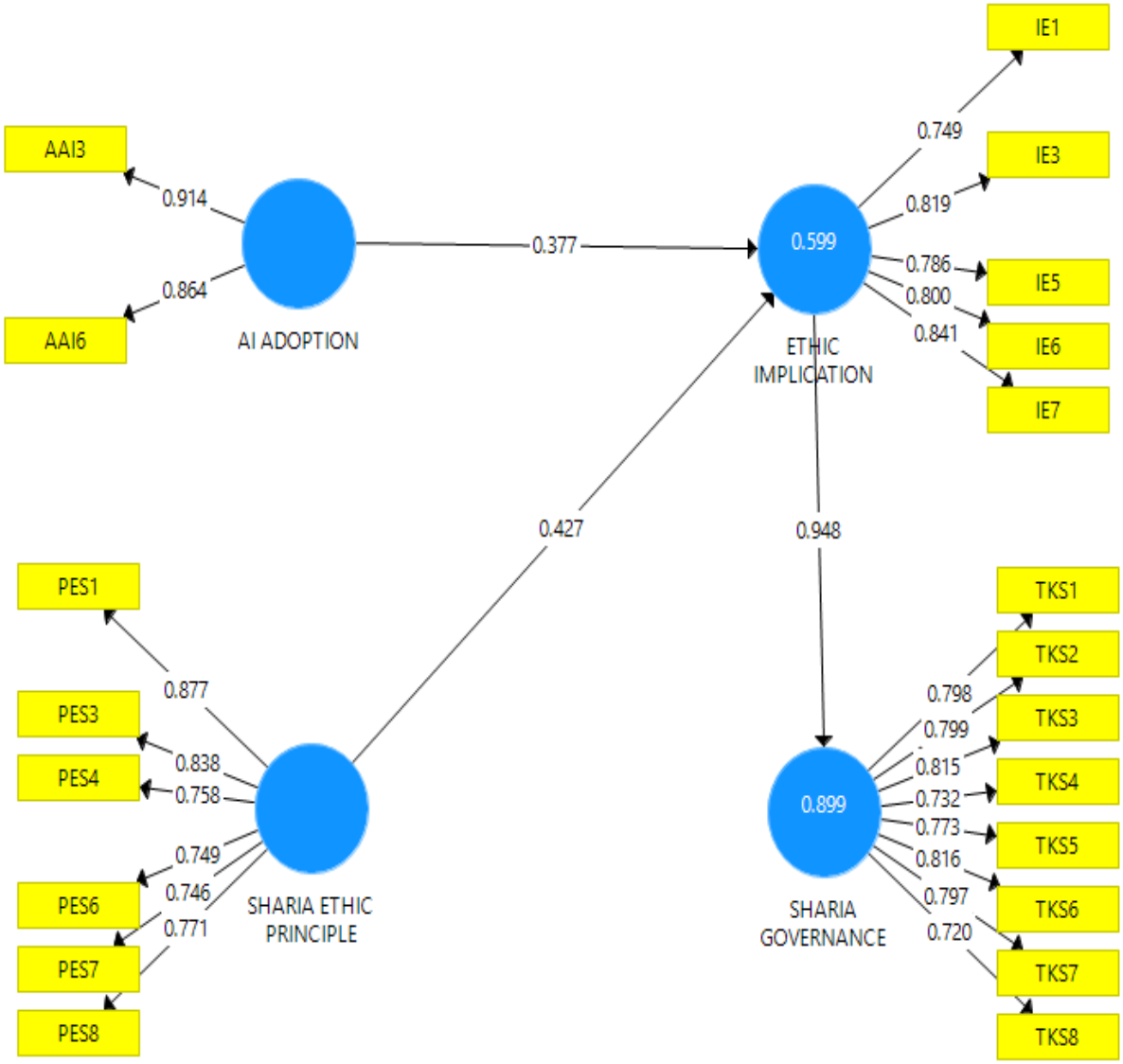


Figure 1. The results of measurement model using PLS-SEM in the research "Artificial Intelligence in Indonesian Islamic Banking: Ethical Implications and Shariah Governance

Convergent validity was established through the Average Variance Extracted (AVE), with values ranging from 0.611 to 0.790. All AVE values exceeded the 0.50 threshold, showing that each construct explains more than half of the variance in its indicators. Discriminant validity was assessed using the Fornell-Larcker criterion and the HTMT ratio. The square root of each construct's AVE exceeded its correlations with other constructs, satisfying the Fornell-Larcker criterion. Additionally, all HTMT values were below 0.85, confirming satisfactory discriminant validity.

Table 2. Measurement Model Assessment

Construct	Cronbach's Alpha	Composite Reliability	AVE
AI Adoption (X1)	0.738	0.883	0.790
Shariah Ethical Principles (X2)	0.881	0.909	0.626
Ethical Implications (M)	0.859	0.899	0.640
Shariah Governance (Y)	0.909	0.926	0.611

Source: Smart PLS Report

Before assessing the structural relationships, we checked coleniarity. All VIF values were below 5, ranging from 1.518 to 3.254, indicating no multicollinearity issues. The structural model was assessed for its explanatory power and predictive relevance. The R^2 value for Ethical Implications (M) was 0.612, indicating that AI Adoption (X1) and Shariah Ethical Principles (X2) together explain 61.2% of the variance in Ethical Implications. The R^2 value for Shariah Governance (Y) was 0.574, indicating that Ethical Implications explain 57.4% of the variance in Shariah Governance. Both R^2 values are considered substantial in social science research (Hair et al., 2019).

Table 3. Structural Model Assessment

Path	Path Coefficient (β)	T-Statistic	P-Value	Result
H1: X1 → M	0.377	5.414	0.000	Supported
H2: X2 → M	0.427	6.120	0.000	Supported
H3: M → Y	0.948	148.481	0.000	Supported
H4: X1 → M → Y	0.357	5.376	0.000	Supported
H5: X2 → M → Y	0.405	6.099	0.000	Supported

Source: Smart PLS Report

Hypothesis Testing

H1: AI Adoption → Ethical Implications. The results indicate a positive and significant relationship between AI Adoption and Ethical Implications ($\beta = 0.377$, $t = 5.414$, $p < 0.001$). This finding supports H1. It suggests that as AI adoption increases in Islamic banks, the perceived ethical implications become more pronounced. This aligns with the literature, which argues that while AI offers significant benefits, it also introduces ethical considerations that must be managed (Bas et al., 2025; Kismawadi, 2024). The positive relationship indicates that banks that are more advanced in their AI adoption are also more cognizant of the ethical dimensions involved.

H2: Shariah Ethical Principles → Ethical Implications. The results show a positive and significant relationship between Shariah Ethical Principles and Ethical Implications ($\beta = 0.427$, $t = 6.120$, $p < 0.001$). This finding supports H2. It indicates that the stronger the alignment of AI practices with Maqashid Shariah principles, the more positive the perceived ethical

implications. This underscores the importance of grounding AI deployment in Islam's ethical framework. When AI systems are designed and used in accordance with principles of justice, transparency, and public interest, they are more likely to be perceived as ethically sound (Mulyono & Edris, 2025; Alshaer, 2024).

H3: Ethical Implications → Shariah Governance. The results show a strong positive and significant relationship between Ethical Implications and Shariah Governance ($\beta = 0.948$, $t = 148.481$, $p < 0.001$). This finding supports H3. It reveals that the perceived ethical implications of AI have a substantial direct effect on the effectiveness of Shariah governance. In other words, when the ethical implications of AI are positive meaning privacy is protected, bias is minimized, and decisions are transparent and accountable the effectiveness of Shariah governance is enhanced. Conversely, if ethical implications are negative, Shariah governance effectiveness is likely to be undermined. This finding highlights the critical role of ethical considerations in AI governance in Islamic banks.

H4: Mediation of Ethical Implications (X1 → M → Y). The bootstrapping analysis confirms that the indirect effect of AI Adoption on Shariah Governance through Ethical Implications is positive and significant ($\beta = 0.357$, $t = 5.376$, $p < 0.001$). This supports H4. It indicates that Ethical Implications fully mediate the relationship between AI Adoption and Shariah Governance. This means that AI adoption does not directly affect Shariah governance; rather, its effect is transmitted through its impact on ethical implications. This finding is theoretically significant, as it suggests that the mere adoption of AI is not sufficient to improve Shariah governance. Instead, what matters is how AI is adopted specifically, whether it is adopted in an ethically responsible manner.

H5: Mediation of Ethical Implications (X2 → M → Y). The bootstrapping analysis also confirms that the indirect effect of Shariah Ethical Principles on Shariah Governance through Ethical Implications is positive and significant ($\beta = 0.405$, $t = 6.099$, $p < 0.001$). This supports H5. It indicates that Ethical Implications fully mediate the relationship between Shariah Ethical Principles and Shariah Governance. This finding suggests that the influence of Shariah ethical principles on governance effectiveness is realized through their impact on the ethical implications of AI. When AI practices are firmly rooted in Maqashid Shariah, they produce positive ethical implications, which in turn strengthen Shariah governance.

Discussion

The findings of this study provide compelling evidence for the central role of ethical implications in the relationship between AI adoption, Shariah ethical principles, and Shariah governance in Indonesian Islamic banking. The full mediation effects observed for both H4 and H5 are particularly noteworthy and have significant theoretical and practical implications. The Primacy of Ethics in AI-Driven Shariah Governance. The finding that ethical implications fully mediate the relationship between AI adoption and Shariah governance challenges the assumption that technology adoption alone can enhance governance. Instead, it suggests that the governance benefits of AI are contingent upon the ethical quality of its implementation. This is consistent with the growing body of literature on Responsible AI, which argues that ethical considerations must be embedded throughout the AI lifecycle, from design to deployment and decommissioning (Loucif et al., 2025). In the Islamic finance context, this means that Shariah governance frameworks must be expanded to include mechanisms for assessing, monitoring, and mitigating AI-specific ethical risks. The current focus of Shariah

governance on compliance with contractual and transactional rules is necessary but insufficient; it must be complemented by a robust ethical governance framework that addresses the unique challenges of AI.

Aligning AI with Maqashid Shariah. The significant positive effect of Shariah Ethical Principles on Ethical Implications (H2) confirms the importance of grounding AI in the normative framework of Maqashid Shariah. This finding supports the arguments of scholars like Mulyono and Edris (2025), who posit that AI is permissible in Islamic finance as long as it promotes justice and does not contravene Shariah principles. The practical implication is that Islamic banks should develop clear guidelines for AI deployment that are explicitly based on Maqashid Shariah. These guidelines should address critical areas such as data privacy (hifz al-mal), algorithmic fairness (iqamah al-adl), and the preservation of human moral agency (taklif). Bridging the Regulatory Gap. The findings also highlight the urgent need for regulators to bridge the gap between existing Shariah governance regulations and the specific challenges posed by AI. While POJK No. 2/2024 provides a solid foundation, it does not offer detailed guidance on AI-specific issues such as algorithmic explainability, data governance, or the ethical use of customer data (Bas et al., 2025). The OJK's 2025 Artificial Intelligence Ethics Guidelines, which emphasize transparency, accountability, and human oversight, are a welcome development (OJK, 2025). However, these guidelines need to be operationalized within the Islamic banking sector, with clear requirements for Shariah-compliant AI audits and risk assessments.

The Role of the Shariah Supervisory Board (DPS). The study's findings have significant implications for the role of the DPS. As AI becomes more deeply embedded in banking operations, the DPS must develop the technical competence to understand and evaluate AI systems from a Shariah perspective. This includes the ability to assess algorithmic fairness, interrogate the logic of AI-driven decisions, and ensure that AI systems do not introduce new forms of gharar or riba. The current focus of DPS qualifications on traditional Islamic jurisprudence must be supplemented with training in technology ethics and AI governance. Implications for AI Adoption Strategies. For Islamic banking practitioners, the findings suggest that AI adoption strategies should be ethically led. Rather than viewing ethics as a constraint, banks should view it as a strategic enabler. By proactively addressing ethical concerns related to privacy, bias, and transparency, banks can build trust with customers, enhance their reputation, and strengthen their Shariah governance. The positive relationship between AI adoption and ethical implications (H1) suggests that early adopters of AI are also more likely to be aware of and responsive to ethical concerns. This presents an opportunity for industry leaders to develop and share best practices for ethical AI in Islamic finance.

Theoretical Contributions. This study makes several theoretical contributions. First, it integrates the Technology Acceptance Model, Maqashid Shariah, and Responsible AI frameworks into a single, coherent model. This integration provides a more holistic understanding of the factors that influence the successful and ethical adoption of AI in Islamic finance. Second, it empirically demonstrates the mediating role of ethical implications, thereby advancing our understanding of the mechanisms through which AI adoption and Shariah principles affect governance outcomes. Third, it contributes to the growing literature on Islamic fintech governance by providing empirical evidence from the Indonesian context, which is the largest Islamic finance market in the world. This study has several limitations that should be acknowledged. First, the cross-sectional design limits the ability to draw causal inferences. Future research could employ longitudinal designs to examine how the relationships between the variables evolve over time. Second, the data were collected from a single country (Indonesia), which may limit the generalizability of the findings to other contexts. Future

studies could replicate this model in other Islamic finance markets, such as Malaysia, the Gulf Cooperation Council (GCC) countries, or Pakistan. Third, the study relied on self-reported measures, which are subject to social desirability bias. Future research could incorporate objective measures of governance effectiveness, such as Shariah audit findings or regulatory compliance records. Fourth, the study focused on professionals' perceptions within Islamic banks. Future research could also incorporate the perspectives of customers, who are the ultimate beneficiaries of AI-driven services, to provide a more complete picture of ethical implications. Fifth, the model tested in this study could be extended by including moderating variables such as organizational size, regulatory stringency, or the level of AI maturity. Finally, qualitative research, such as in-depth interviews with Shariah scholars and AI developers, could provide richer insights into the practical challenges and opportunities of aligning AI with Shariah principles.

CONCLUSION

This study set out to investigate the ethical implications and Shariah governance dynamics of AI adoption in Indonesian Islamic banking. The findings demonstrate that ethical implications play a pivotal and fully mediating role in the relationship between AI adoption, Shariah ethical principles, and Shariah governance effectiveness. The study concludes that AI can be a powerful tool for enhancing Shariah governance, but only if its adoption is firmly grounded in the ethical and legal framework of Maqashid Shariah. The "black box" of AI must be illuminated by the light of Shariah principles, ensuring that technology serves humanity in a manner that is just, transparent, and accountable. For Indonesian Islamic banking to maintain its integrity and leadership in the global Islamic finance industry, it must embrace a model of AI adoption that is ethically led, Shariah-compliant, and governance-driven. The findings of this study provide a roadmap for achieving this goal and offer valuable insights for policymakers, regulators, and practitioners alike.

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