

DETERMINING LEGAL STATUS AND LIABILITY OF AUTONOMOUS ARTIFICIAL INTELLIGENCE SYSTEM IN ISLAMIC SMART CONTRACTS

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Abstract

The rapid development of artificial intelligence has given rise to autonomous systems capable of performing acts with legal consequences, particularly through smart contracts. This development presents a fundamental challenge to Islamic contract law: whether autonomous AI can possess the legal capacity required to become a contracting party and how liability arising from its acts should be determined. To address these questions, this study employs doctrinal legal research using philosophical and conceptual approaches. Primary, secondary, and tertiary legal materials were collected through documentary research and examined using argumentative legal analysis. The findings demonstrate that autonomous AI does not satisfy the requirement of *al-‘āqil*, namely a rational legal subject possessing full *ahliyyah al-adā'* or legal capacity to perform legally valid acts, as attributed to human beings. Nevertheless, this study advances a novel argument based on *qiyās al-adnā* by analogizing the operational status of autonomous AI to the classical legal position of an authorized slave, or *‘abd ma’dhūn*, who acts with the permission of his master. On this basis, autonomous AI may be understood not as an independent legal person, but as a non-human instrument operating within a delegated authority. Consequently, the validity of smart contracts may be recognized through the concept of *wakālah muqayyadah*, while liability for the AI's acts is attributed to the principal or *muwakkil*. In cases involving multiple parties, this study further proposes the integration of *kafālah* and *takāful* as mechanisms for allocating and collectively managing liability.

Keywords: *Smart Contract; Autonomous Artificial Intelligence; Islamic Law of Contract; Legal Status; Liability.*

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1. Introduction

In Islamic law, contracts are presumed permissible by default. This is based on the juristic principle, "*al-ashalu fil mu'amalah al-ibahah illa ma dalla al-dalilu 'ala tahrimihi*"¹ (all transactional matters are inherently lawful unless there is proof to the contrary). This principle is a familiar and essential foundation for commercial dealings, allowing for contractual innovation as long as it does not conflict with categorical textual prohibition like *riba*, *gharar*, and *maysir*.² In fiqh literature, a contract is referred to as an *'aqd* - a term derived from its literal meaning of "a tie" or "to bind."³ According to the majority of Muslim scholars (*jumhur ulama*), an *'aqd* is defined as a conjunction between an offer (*ijab*) and acceptance (*qabul*) that is sanctioned by sharia and which gives rise

¹ A. Djazuli, *Kaidah-Kaidah Fikih: Kaidah-Kaidah Hukum Islam dalam Menyelesaikan Masalah-Masalah Praktis*, (Jakarta: Kencana, 2019), 130.

² Indonesian Council of Ulama, *Fatwa No. 1 of 2004 on Interest* (Jakarta: Indonesian Council of Ulama, 2004), <https://mui.or.id/baca/fatwa/hukum-bunga-interestfaidah>.

³ Qur'an, al-Maidah (5): 1.

to legal consequences for its object.⁴ Article 20 paragraph (1) of the the Compilation of Sharia Economic Law, a contract is an agreement between two or more parties to perform or refrain from performing a specific legal act.⁵ The validity of a contract is contingent upon the fulfillment of its essential elements (*rukun*) and condition (*shart*), these primarily comprise contracting parties (*'aqidain*), the subject matter of the contract (*mahal al-'aqd*), and the expression of the consent (*sighat al-'aqd*).⁶

As technology has advanced, *fuqaha* (Islamic jurists) have expanded the permissible modes of *sighat* (the formula of offer and acceptance) beyond oral declarations (*qauli*) to include written agreements (*kitabî*) and physical conduct (*fi'li*).⁷ Modern transactions, such as those at vending machines, exemplify this latter form, known as *mu'atah* (mutual exchange).⁸ This flexibility demonstrates that *fiqh* (Islamic jurisprudence) does not rigidly prescribe the *form* of a contract; rather, it secures the *substance*, namely mutual consent that is free from coercion (*ikrah*) and significant uncertainty (*gharar*). However, a fundamental, previously unimaginable challenge now confronts this framework, which is based on the human as the sole legally responsible subject (*mukallaf*). This challenge arises from the advent of "Era 5.0," which introduces technologies that not only automate processes but also autonomize decision-making, particularly through autonomous artificial intelligence.⁹ One significant impact of AI is the facility it provides for smart contracts: computer protocols that automatically execute, verify, or enforce the negotiation and performance of an agreement once predefined conditions are met.¹⁰ The term smart contract was first introduced in the 1990s by Nick Szabo, a computer scientist, legal scholar, and cryptographer.¹¹ Initially, smart contracts were rigid 'if-then' scripts, serving merely as digital executors of human will, which was fully embedded within the code.¹² However, this form has changed drastically with the emergence of autonomous AI, particularly machine learning and deep learning.¹³ A shift is now occurring from the smart contract as a tool to the smart contract *driven by an agent*.¹⁴ AI agents are now capable of more than mere execution; they can analyze

⁴ Gemala Dewi, Wirdyaningsih, and Yeni Salma Barlinti, *Hukum Perikatan Islam di Indonesia*, 5th ed. (Jakarta: Kencana, 2018), 44.

⁵ Pusat Pengkajian Hukum Islam dan Masyarakat Madani, *Kompilasi Hukum Ekonomi Syariah*, Revision, vol. 3 (Jakarta: Kencana, 2017), 15.

⁶ Pusat Pengkajian Hukum Islam dan Masyarakat Madani, *Kompilasi Hukum Ekonomi Syariah*, 22.

⁷ Mohd Zulkifli Muhammad et al., "Shariah-Compliant E-Payment Framework in Malaysia: Integrating Fiqh, Digital Security and Regulatory Governance," *Journal of Fatwa Management and Research* 30, no. 2 (May 2025): 34–54, <https://doi.org/10.33102/jfatwa.vol30no2.638>.

⁸ Nurul Afifah and Nur Lailatul Musyafa'ah, "Analisis Hukum Islam Terhadap Jual Beli," *Maliyah : Jurnal Hukum Bisnis Islam* 09, no. 1 (2019): 118–37, <https://doi.org/10.15642/maliyah.2019.9.1.118-137>.

⁹ B. D. Deebak and Fadi AL-Turjman, "Privacy-Preserving in Smart Contracts Using Blockchain and Artificial Intelligence for Cyber Risk Measurements," *Journal of Information Security and Applications* 58 (May 2021): 102749, <https://doi.org/10.1016/j.jisa.2021.102749>.

¹⁰ Weiqin Zou et al., "Smart Contract Development: Challenges and Opportunities," *IEEE Transactions on Software Engineering* 47, no. 10 (October 2021): 2084–106, <https://doi.org/10.1109/TSE.2019.2942301>.

¹¹ Ghassan Adhab Atiyah et al., "Legitimacy of Smart Contracts from the Perspective of Islamic Law: A Case Study of Blockchain Transactions," *Al-Istinbath: Jurnal Hukum Islam* 9, no. 1 (May 2024): 155, <https://doi.org/10.29240/jhi.v9i1.8726>.

¹² Liwei Ouyang, Wenwen Zhang, and Fei-Yue Wang, "Intelligent Contracts: Making Smart Contracts Smart for Blockchain Intelligence," *Computers and Electrical Engineering* 104 (December 2022): 108421, <https://doi.org/10.1016/j.compeleceng.2022.108421>.

¹³ I. Gusti Kade Budi H., *Artificial Intelligence (Konsep, Potensi Masalah, Hingga Pertanggungjawaban Pidana)*, 1st ed., 1 (Depok: Rajawali Press, 2022), 34.

¹⁴ Yuriy Truntsevsky and Vyacheslav Sevalnev, "Smart Contract: From Definition to Certainty," *Legal Issues in the Digital Age* 2, no. 1 (May 2021): 100–122, <https://doi.org/10.17323/2713-2749.2021.1.100.122>.

real-time market data, predict fluctuations, renegotiate contract terms, and make complex execution decisions all without direct human intervention (i.e., human-out-of-the-loop).¹⁵

The principle of *mu'atah* in classical fiqh can be extended to legitimize automatic execution by code, with the argument that *ijab* and *qabul* have occurred when the parties agree to use the smart contract.¹⁶ The efficiency, transparency of blockchain, and reduction in transaction costs offered by this technology are clearly in line with *Maqashid al-syariah*, particularly in terms of protecting property (*hifz al-mal*) and fulfilling promises (*al-wafa' bil 'ahd*) because Islam wants ease, not hardship.¹⁷ For example, if you cannot find water for ablution, you may use dust for *tayammum* as a substitute for ablution.¹⁸ However, this is where the similarities end and significant differences emerge, namely in the pillar of *'aqidain*. Fiqh requires *ahliyyah* based on *'aql* and *tamyiz*, which are attributes exclusive to humans.¹⁹ Autonomous AI, even though it has superlative intelligence in data processing, does not have *'aql* in the Sharia sense; it does not have consciousness, morality, or status as a *mukallaf*. When this AI autonomously negotiates a contract or agreement, whose *sighat* is actually reflected? If the AI acts outside of the predicted provisions, can the consent (*ridha*) of the human party who delegated it still be considered valid? This certainly raises the uncertainty of autonomous AI, which can be termed *gharar* algorithmic.

The uncertainty of the legal status of autonomous AI system in smart contracts not only raises theological-normative issues but also concerns related to access to justice.²⁰ When algorithms perform harmful actions such as making irrational transaction, it creates uncertainty in determining the legal subject liable.²¹ The confusion regarding whether the legal burden lies with the code developer or the user creates a vacuum of liability that according to Islamic law, contradicts the principle of liability (*al-daman*), which is part of the application of *maqashid al-syariah*. Therefore, tracing and determining the legal status and liability of autonomous AI system becomes important to ensure that technological innovations do not contradict Islamic law.

If referring to regulations in Indonesia such as Law Number 11 of 2008 on Electronic Information and Transactions (ITE Law) as amended by Law Number 1 of 2024, it fundamentally recognizes the validity of electronic contracts and binds the parties that create them.²² However, the concept of “electronic agents” mentioned in the ITE Law and Government Regulation No. 82 of 2012 is still assumed to be passive devices that act based on human instructions, not autonomous entities capable of learning and making decisions independently.²³ The second amendment to the ITE Law in 2024 also does not address this substance, but rather focuses on strengthening digital identity and electronic certification as well as child protection without

¹⁵ Deebak and AL-Turjman, “Privacy-Preserving in Smart Contracts Using Blockchain and Artificial Intelligence for Cyber Risk Measurements.”

¹⁶ Abdulmajid Obaid Hasan Saleh, Alaa Saleh Halawani, and Mohammad Abdelhamid Salem Qataweh, “The Shariah Framework for Smart Contracts, an Original Analytical Study,” *Lect. Notes Networks Syst.* 487 (2023): 1033–46, https://doi.org/10.1007/978-3-031-08084-5_73.

¹⁷ Qur'an, al-Baqarah (2): 185.

¹⁸ Qur'an, al-Maidah (5): 6.

¹⁹ Mohd Hilmi Ramli, “Al-Taftāzānī's Discussion on The Nature of Man Sine Qua Non (Essential) to The Mukallaf in The Science of Uṣūl Al-Fiqh,” *Jurnal Fiqh* 22, no. 1 (June 2025): 108–33, <https://doi.org/10.22452/fiqh.vol22no1.4>.

²⁰ Elena Anatolyevna Kirillova et al., “Legal Status of Smart Contracts: Features, Role, Significance,” *Juridicas CUC* 15, no. 1 (2019): 285–300, <https://doi.org/10.17981/juridcuc.15.1.2019.11>.

²¹ Gino Fontana and Nicola Pierpaolo Barbuzzi, “Legal aspects of electronic agents: smart contract, algorithmic personhood, and computational logic,” *Rivista Italiana di Informatica e Diritto* 7, no. 2 (2025): 1–17, <https://doi.org/10.32091/RIID0235>.

²² Ery Agus Priyono et al., “Digital Transformation of Contract Law: Legal Certainty and Human Rights Protection in AI-Based Contracts,” *Jurnal Suara Hukum* 8, no. 1 (March 2026): 133–66, <https://journal.unesa.ac.id/index.php/suarahukum/article/view/50431>.

²³ Angga Priancha et al., “Rethinking ‘Electronic Agent’ Terminology In the Law on Electronic Information and Transaction from the Perspective of Indonesian Lastgeving Law,” *Mimbar Hukum* 34, no. 2 (2022): 378–402, <https://doi.org/10.22146/mh.v34i2.3864>.

touching on the legal issues arising from the actions of autonomous AI system beyond human prediction.²⁴

In sectoral regulations such as the Financial Services Authority Regulation (POJK) Number 3 of 2024 on the Implementation of Financial Sector Technology Innovation, smart contract have been accommodated as part of activities requiring an OJK license in terms of capital raising.²⁵ However, this recognition is still limited to the infrastructure and business model, and has not yet touched upon the civil law dimension related to the legal status and liability of autonomous AI system.²⁶ Then, in the realm of sharia economic law, there are also no guidelines for addressing contracts made by autonomous AI system. For example, in the Compilation of Sharia Economic Law (KHES), which serves as guideline for religious court judges in adjudicating sharia economic cases, there is no recognition of legal subjects other than humans and legal entities.²⁷ Furthermore, the DSN-MUI Fatwa No. 117/DSN-MUI/II/2018 on Information Technology-Based Financing Services only emphasizes the permissibility of sharia fintech transactions as long as the transactions are free from *riba*, *gharar*, and *maysir*.²⁸ Thus, referring to the preceding regulations, it can be understood that the status and liability of autonomous AI system are still ambiguous.

Up to now, studies related to autonomous artificial intelligence have always been a subject of debate and controversy among academics regarding its legal capacity, including its involvement in executing smart contracts.²⁹ This phenomenon can be seen from the many studies discussing smart contracts and artificial intelligence from various aspects. From the perspective of Islamic law, Miszairi Sitiris and Sahid Abdullahi Busari argue that artificial intelligence does not have the capacity to be a legal subject like humans, but it does have an artificial personality that is justified in Islam with the responsibility to protect the public interest.³⁰ Although the research identified the absence of legal capacity in autonomous AI system due to the lack of *'aq'* and *tamyiz*, methodologically, the research is limited because it lacks a foundation in jurisprudence (*fiqh*) to determine the law, leaning more toward the application of public interest. Therefore, this study strengthens that study by providing a strong argumentative foundation in determining the status and liability of autonomous AI system.

More specifically, research conducted by Emre Bayamlioglu shows that intelligent agents in a contract are merely tools that can act autonomously. Due to their autonomous nature, it is difficult to determine who is responsible if a loss occurs in the contract. Therefore, in his research, he proposes giving autonomous AI the same legal status as a legal entity.³¹ If the argumentation of the research is built on civil law, then this study is based on Islamic contract law, so there is a

²⁴ Hufon Hufon et al., "Digital Platform Power Play: Indonesian and European Union Law Perspective," *Lex Scientia Law Review* 8, no. 2 (November 2024): 707–42, <https://doi.org/10.15294/lsr.v8i2.13669>.

²⁵ Agustianto Agustianto and Ampuan Situmeang, "Legal Validity of Smart Contracts for Investment Purposes: Analysis of Indonesia's Legal Politics and Emerging Challenges," *Masalah-Masalah Hukum* 54, no. 2 (July 2025): 269–82, <https://doi.org/10.14710/mmh.54.2.2025.269-282>.

²⁶ Priyono et al., "Digital Transformation of Contract Law."

²⁷ Yasardin Yasardin and Syuhod B. Kooria, "Revisiting the Compilation of Islamic Economic Law in Indonesia: Legal Challenges and Pathways to Harmonization," *JURIS (Jurnal Ilmiah Syariah)* 24, no. 1 (June 2025): 127–36, <https://doi.org/10.31958/juris.v24i1.13736>.

²⁸ Tri Hidayati et al., "Digitalization of Islamic Finance: Epistemological Study of the National Sharia Board-Indonesian Council of Ulama's Fatwa," *Al-Ahkam* 33, no. 2 (October 2023): 255–78, <https://doi.org/10.21580/ahkam.2023.33.2.17324>.

²⁹ Ida Madieha Abdul Ghani Azmi and Mahyuddin Daud, "Liability Gap, Personhood Theories and Effective AI Legal Framework in the GCC Countries: Shariah as the Thread That Binds," in *Political Economy of the Middle East*, Part F516 (Palgrave Macmillan, 2025), 241–60, https://doi.org/10.1007/978-981-96-4020-1_11.

³⁰ Miszairi Sitiris and Saheed Abdullahi Busari, "The Legal Capacity (Al-Ahliyyah) of Artificial Intelligence from an Islamic Jurisprudential Perspective," *Malaysian Journal of Syariah and Law* 12, no. 1 (April 2024): 31–42, <https://doi.org/10.33102/mjssl.vol12no1.453>.

³¹ Emre Bayamlioglu, "Intelligent Agents and Their Legal Status," *Ankara Bar Review* 1, no. 1 (January 2008): 46–54, <https://izlik.org/JA56LU57ZT>.

difference in the basis for determining the status and liability of the autonomous AI system between the previous research and this study.

Another research was also expressed by Shuq Hussein and Ali al-Obeidi expressed similar views in their research that autonomous AI and robots can be given legal personality through the concept of “electronic personality or electronic persona” so that they can be held accountable for their independent decisions, thereby reducing the liability of manufacturers.³² According to the author, this opinion cannot be used as a basis to argue that autonomous AI system cannot be granted legal personality since these systems do not have rights and obligations like humans do. This argumentation is supported by Nur Adlin Hanisah binti Shahul Ikram and Mohd Yazid bin Zul Kepli research, which states that autonomous AI in the form of human-like robots is prohibited in Islamic law unless it is beneficial to society. It is prohibited because there are concerns that it could change the structure of society in ways that could be harmful.³³ The benefits of AI can be felt in the study of zakat, where research by Zaid, Al-Khamdi, and Alghamdi shows that if AI used to generate trading income such as automated stocks, then the results from AI are subject to zakat. Therefore, the perspective used is the aspect of public benefit (*maslahah*).³⁴

Based on several previous studies, it can be identified that there has not yet been a study specifically discussing the status and legal liability of autonomous AI systems in Islamic contract law through the application of *wakalah muqayyadah* found through the method of legal analogy (*qiyas*). Thus, the uniqueness of this study lies in the determination of law used, which is based on analogy that has never been explicitly used in existing literature, whether in contemporary fiqh studies or other Islamic studies. To better understand the uniqueness of this study, the following is presented in table form:

Table 1.
Comparative analysis of research gaps

Authors	Focus of Study	Methodology	Findings	Gaps
Sitiris & Busari	The legal capacity of AI from a fiqh perspective	Normative analysis with a <i>maslahah</i> approach	AI lacks <i>ahliyyah</i> due to the missing <i>'aql</i> and <i>tamyiz</i>	Does not use methodological principles like <i>qiyas</i> ; does not propose a contractual operational framework
bayamlioglu	The status and liability of autonomous AI system in contract	Normative analysis with conceptual approach based on civil law	Autonomous AI system is a tool that is difficult to hold liability; thus, a legal status similar to a corporation	Based on secular law, not Islamic contract law; does not touch on the doctrine of <i>wakalah</i>
Hussein & Al-ubeidi	Granting legal personality to autonomous AI systems	Civil law comparative approach	Autonomous AI can be granted electronic personality for independent liability	Does not explore fiqh mechanisms to address the rigidity of legal subject; does not discuss the implication of contract pillars in sharia

³² Shuq Hussein and Ali Al-Obeidi, “Robotics and AI Systems: Legal Personality for AI System Under UAE Law and Islamic Jurisprudence,” December 6, 2023, 1–8, <https://doi.org/10.1109/acit58888.2023.10453710>.

³³ Nur Adlin Hanisah Shahul Ikram and Mohd Yazid Zul Kepli, “Establishing Legal Rights and Liabilities for Artificial Intelligence,” *IJUM Law Journal* 26, no. 1 (June 2018): 161–161, <https://doi.org/10.31436/iiumlj.v26i1.382>.

³⁴ Saud M. Alholiby Albin Zaid, Mubarak M. Alkhaldi, and Mohammad A. Alghamdi, “The Zakatability of AI: A Dual Analysis from Sharia and Saudi Law,” *Journal of Posthumanism* 5, no. 5 (May 2025): 2357–69, <https://doi.org/10.63332/joph.v5i5.1621>.

Authors	Focus of Study	Methodology	Findings	Gaps
Ikram & Zul Kepi	Autonomous AI in the form of humanoid robots under Islamic law	Normative analysis in fiqh	Humanoid robots are prohibited unless beneficial, as they have potential to disrupt social structure	Focus on autonomous AI in smart contracts; legal discovery through analogy
Zaid, Al- Khamdi & Alghamdi	Redefining the status of AI in Islamic law and positive law	Qualitative analysis using comparative and conceptual analysis	AI can be classified as a commodity if it functions as service provider; can be granted limited legal status	Differences in methodology for legal discovery

Source: Author analysis, 2026

The main causes of this discrepancy include academic debates, as in previous studies, regarding the different paradigms used in examining the issue of autonomous AI. In addition, the pace of technological innovation and the evolution of Islamic jurisprudence are not in sync, resulting in many academics presenting arguments based on their own conclusions.³⁵ This is similar to what is stated in the rules of *fiqh*, that laws change as times change. Therefore, it is common for new issues to arise and then be responded to through fiqh studies with contemporary *ijtihad*, as long as it brings benefits to humanity.³⁶ Autonomous AI presents something that was previously unimaginable. As a result, there is uncertainty among the public regarding the status and accountability of autonomous AI use, particularly in smart contracts within society.³⁷ However, Islamic jurisprudence continues to strive to provide answers or legal certainty to the public regarding new issues. Therefore, this study proposes two issues as the focus of this study, namely, what is the legal status of contracts negotiated and executed by autonomous AI? If the contract is valid, who bears legal responsibility (*mas'uliyah*) if the AI makes a mistake, defaults, or causes losses? This study is important because there is still debate among academics regarding the status and responsibility of autonomous AI, which has caused confusion among the public. Therefore, this study has originality and uniqueness in the application of *wakalah muqayyadah* as an operational legal framework for autonomous AI system in Islamic smart contract, conducted through one of the legal discovery methods, namely analogy (*qiyas*) *adna* with classical cases that have already occurred.

To address the previously mentioned problem, this study employs a theoretical framework consisting of three parts: the theory of legal capacity (*ahliyyah*), which in classical jurisprudence (*fiqh*) refers to an individual's eligibility to be a legal subject. This theory is used to analyze autonomous AI systems that fundamentally lack 'aql and *tamyiz* as requirements for *taklifi*, thus raising the question of whether they can be categorized as valid 'aqidain in a contract or whether they remain positioned as legal objects. To determine this legal status, the doctrinal concept used is *wakalah muqayyadah*, so that the status of autonomous AI system will be analogously positioned as an agent acting on behalf of and for the benefit of the human principal. The determination of this doctrine is based on one of the methods of legal finding, namely *qiyas* or analogy, which is applied to contextualize autonomous AI system with classical jurisprudential legal entities to formulate relevant rules.

³⁵ Younes Soualhi and Abdulmajid Obaid Hasan Saleh, "Smart Contracts and Their Application Prospects in Social Banking: A Maqasid Jurisprudential Perspective," *Malaysian Journal of Syariah and Law* 12, no. 2 (2024): 490–510, <https://doi.org/10.33102/mjssl.vol12no2.599>.

³⁶ Djazuli, *Kaidah-Kaidah Fikih: Kaidah-Kaidah Hukum Islam Dalam Menyelesaikan Masalah-Masalah Praktis*, 28.

³⁷ Vasiliki Papadoulis, "The Role of the Autonomous Machines at the Conclusion of a Contract: Contractual Responsibility According to Current Rules of Private Law and Prospects," in *Artificial Intelligence and Normative Challenges: International and Comparative Legal Perspectives*, ed. Angelos Kornilakis et al. (Cham: Springer International Publishing, 2023), 65–84, https://doi.org/10.1007/978-3-031-41081-9_5.

2. Method

The research method used is doctrinal research, as it examines Islamic legal sources, particularly Islamic contract law, in order to resolve issues related to the status and liability of autonomous AI system in executing smart contracts. The approach used is a philosophical approach because it examines the principles or rules of Islamic law that can be applied in analyzing legal issues such as autonomous AI system in smart contracts, and a conceptual approach, as it explores the doctrines of Islamic scholars related to relevant concepts that can be applied in analyzing the status and accountability of autonomous AI system.³⁸

The data source used is secondary data collected through document or literature studies, resulting in relevant legal materials, namely primary legal materials which consist of the Qur'an Hadith, Ijma', Qiyas, the Compilation of Islamic Economic Law (KHES) and relevant statutes. Meanwhile, secondary legal materials consist of classical fiqh books, fatwas of the National Sharia Council of the Indonesian Ulama Council, and relevant national and international journals. The tertiary legal materials were not used in this study. This aims to assist in understanding the legal issues being faced or examined.³⁹

All legal materials that have been collected are then analyzed using argumentative analysis techniques with systematic and logical legal reasoning supported by the opinions of scholars through their books.⁴⁰ Paul Scholten stated that the logic of law is not only derived from formulated laws but also from law as part of human consciousness.⁴¹ This argument is constructed on the basis of the legal and liability theory in Islamic contract law and employs *qiyas* as a source of *ijtihad* in determining the legal status and liability of autonomous AI system in smart contract.⁴² Operationally, this research analogizes the position of an autonomous AI system acting without direct human intervention to Islamic jurisprudence (*fiqh*), specifically the status of a permitted slave (*'abd madhun*) or an underage (*al-shaghiir*) who is not yet legally competent but acts under the permission of their guardian.

3. Results and Discussion

3.1. The Legal Status of Autonomous Artificial Intelligence System in Islamic Contract Law

In Islamic law, to determine who can be a party to a contract or agreement, it is important to know the legal capacity (*ahliyyah*) of the parties.⁴³ Legal capacity is the eligibility of a person to be recognized as a legal subject who has rights and obligations and is capable of accepting the spiritual and legal aspects of Islam. This legal capacity is based on the status of humanity inherent in every person from birth. The fuqaha distinguish a person's legal capacity in two main dimensions.⁴⁴ First, passive legal capacity (*ahliyyatul wujub*), which is the basic capacity to receive rights and be burdened with obligations, based on human life itself. From the moment of conception, a person already has an imperfect passive capacity called *ahliyyah al-wujub an-naqisah*, but he or she is already entitled to certain benefits, such as inheritance and wills, but

³⁸ Johnny Ibrahim, *Teori Dan Metodologi Penelitian Hukum Normatif*, Revised Edition, (Malang: Bayumedia Publishing, 2007), 300.

³⁹ Anthon F. Susanto, *Penelitian Hukum Transformatif-Partisipatoris* (Malang: Setara Press, 2015), 25.

⁴⁰ I. Made Pasek Diantha, *Metode Penelitian Hukum Normatif Dalam Justifikasi Teori Hukum*, (Jakarta: Kencana, 2016), 155.

⁴¹ Paul Scholten, *De Structuur Der Rechtswetenschap*, trans. Bernard Arief Sidharta, 4 (Bandung: PT. Alumni, 2013), 8.

⁴² Zainuddin Ali, *Metode Penelitian Hukum*, 1st ed., 1 (Jakarta: Sinar Grafika, 2022), 79.

⁴³ Ramli, "Al-Taftāzānī's Discussion on The Nature of Man Sine Qua Non (Essential) to The Mukallaf in The Science of Uṣūl Al-Fiqh."

⁴⁴ Sitiris and Busari, "The Legal Capacity (Al-Ahliyyah) of Artificial Intelligence from an Islamic Jurisprudential Perspective."

cannot yet be burdened with any obligations.⁴⁵ After birth and growing into adulthood (lifetime), their legal capacity is complete, which is referred to as *ahliyyah al-wujub al-kamilah*, meaning that they have the right to own property and are obliged to fulfill obligations such as zakat or other financial obligations, even though the implementation is temporarily represented by a guardian. Second, active legal capacity (*ahliyyah al-ada'*), which is the active capacity to perform legal actions such as contracts, sales and purchases, and others, the validity of which is recognized by sharia.⁴⁶ This capacity is highly dependent on the maturity of the mind to be able to distinguish between good and bad. A person who is considered to have no active capacity whatsoever, such as a child or a mentally ill person, shall have all activities related to muamalah, particularly in executing contracts, deemed null and void by law.

The existence of parties who are competent or have the capacity to perform legal acts, particularly in entering into agreements, is fundamental because the validity of an agreement is based on three main pillars that must be fulfilled.⁴⁷ First, the parties involved must be legally competent, meaning they must be adults of sound mind. Second, the object of the agreement must be lawful, clearly defined, and deliverable to avoid uncertainty. Third, the agreement itself must be made in a single forum.⁴⁸ However, increasingly sophisticated technological developments have given rise to increasingly complex issues where autonomous artificial intelligence is used as a party involved in contractual activities. Artificial intelligence can generally be understood as technology that enables computing systems to simulate and perform tasks that normally require human intelligence, such as learning, reasoning, problem solving, and making decisions independently.⁴⁹ For example, there is a blockchain-based aviation insurance company called Fizzy AXA that offers insurance in the event of flight delays. The principle is that if a predetermined condition, such as a flight delay of ≥ 2 hours, is met, compensation is paid automatically, without passengers or customers having to submit a manual claim.⁵⁰

With reference to the requirements for capacity as a legal subject and the main conditions in a contract, autonomous AI cannot be considered a legal subject because many requirements are not met, especially the principles of Islamic contract law, including the principles of divinity, justice, good faith, and honesty. For example, regarding the unfulfilled principle of justice, even though autonomous AI can provide justice as regulated by its users or creators, AI cannot fully do so because AI thinking is limited to the logic programmed into the autonomous AI. Meanwhile, achieving justice is not only seen from one aspect but also requires contemplation or feeling from other aspects. However, if autonomous AI is recognized as a legal subject, the consequence is that autonomous AI has the right to express itself, the right to worship, the right to vote, the right to apply for a job, the right to go to school, and so on. However, these elements cannot be fulfilled by autonomous AI as they are principles that must be fulfilled in Islamic contract law.⁵¹ If this happens, it could undermine human dignity, which is embedded in culture and religion.⁵²

⁴⁵ Nahrowi Nahrowi, "Penentuan Dewasa Menurut Hukum Islam dan Berbagai Disiplin Hukum," *Kordinat: Jurnal Komunikasi antar Perguruan Tinggi Agama Islam* 15, no. 2 (October 2016): 253–74, <https://doi.org/10.15408/kordinat.v15i2.6333>.

⁴⁶ Ahmad Mafaid, "Kecakapan Menerima Hak Dan Melakukan Perbuatan Hukum Dalam Tinjauan Ushul Fiqh," *El-Ahli: Jurnal Hukum Keluarga Islam* 1, no. 1 (July 2020): 88–102, <https://doi.org/10.56874/el-ahli.v1i1.66>.

⁴⁷ Atiyah et al., "Legitimacy of Smart Contracts from the Perspective of Islamic Law."

⁴⁸ B. M. Al-Ifan, "Contract Formation Methods in E-Commerce from Islamic Perspective," *2013 5th International Conference on Information and Communication Technology for the Muslim World (ICT4M)*, March 2013, 1–3, <https://doi.org/10.1109/ICT4M.2013.6518900>.

⁴⁹ Bayamlioglu, "Intelligent Agents and Their Legal Status."

⁵⁰ Truntsevsky and Sevalnev, "Smart Contract."

⁵¹ Gali Katznelson, "AI Citizen Sophia and Legal Status," *The Petrie-Floam Center (Health Law Policy, Biotechnology and Bioethics at Harvard Law School)* (Cambridge), November 9, 2017, <https://petrieflom.law.harvard.edu/2017/11/09/ai-citizen-sophia-and-legal-status/>.

⁵² E. Melnikova and I. Surov, "Legal Status of Artificial Intelligence from Quantum-Theoretic Perspective," *BRICS Law Journal* 10, no. 4 (December 2023): 5–34, <https://doi.org/10.21684/2412-2343-2023-10-4-5-34>.

3.1.1. The Position of Autonomous Artificial Intelligence System in Islamic Contract Law

The legal position of autonomous AI can be mapped into three possible statuses, namely as a tool, representative, or legal subject with limited personality (*syakhsiyyah l'tibariyyah*).⁵³ Here is an explanation:

- a. Artificial intelligence as a tool. The simplest and most understandable view is that AI is a sophisticated tool controlled by humans, meaning that AI is man-made and everything created by humans to facilitate their activities is a tool and cannot replace humans.⁵⁴ In this case, AI acts as an extension of the developer's or user's will in executing contracts,⁵⁵ that can provide databases, draw conclusions, and so on. This is in line with what was stated by an American philosopher named John Searle, in one of his contributions, namely "Chinese Room," that machines may be able to mimic understanding, but they do not possess it.⁵⁶ This means that in the context of Islamic contract law, autonomous AI cannot understand intentions, social, cultural, religious, and moral contexts, which are part of the principles of Islamic contract law. Islam is a religion that makes things easy, not difficult. Therefore, the use of autonomous AI is permissible as long as it does not violate Islamic law. All actions performed by AI are directly attributed to the human who commands it. Consequently, legal responsibility lies entirely with the user or creator, as is the case with other users.
- b. Artificial intelligence as a representative (*al-wakil*). A more sophisticated and relevant view is to see the relationship between AI and its users through the lens of a representative agreement (*wakalah*). In fiqh, *wakalah* is the delegation of authority from one person (*muwakkil*) to another (*wakil*) to perform certain tasks on their behalf, with the provision that actions taken by the representative within the scope of the authority granted will be legally binding on the *muwakkil*. In this context, users (*muwakkil*) grant power or mandate to AI as a representative to perform certain legal actions on behalf of users, just like humans. The program code and parameters set during the creation of smart contracts serve as the limits of the representative's authority, making it a *wakalah muqayyadah* (restricted agency), meaning a representative that has been determined in advance. Actions taken by the AI within the scope of its mandate are legally binding on the user, so this concept shifts the focus from "who" is acting to "on whose behalf" the action is being taken, thereby ensuring that responsibility remains with the human principal.
- c. Artificial intelligence as an independent legal subject because it can make decisions.⁵⁸ This view is the most critical because it grants legal personality to autonomous AI,⁵⁹ For example, the robot Sofia was granted Saudi Arabian citizenship.⁶⁰ Then, Chatbot Shibuya Mirai was

⁵³ I. M. Yaprntsev, I. R. Khmelevskoi, and N. A. Kalashnikov, "AI through the Prism of Its Legal Personality: Basic Characteristics," *Kutafin Law Review* 12, no. 2 (July 2025): 362–83, <https://doi.org/10.17803/2713-0533.2025.2.32.362-383>.

⁵⁴ Noor Al-Huda Alaa Abdul-Latif, Abdul-Sattar Ayesh Abd, and Hussam Jassim Mohammed, "The Legitimacy of Relying on Artificial Intelligence and Its Guidelines in Determining Islamic Legal Rulings: A Jurisprudential Study," *Dragoman Journal*, no. 19 (July 2025): 336–49, <https://doi.org/10.63132/ati.2025.theleg.8166>.

⁵⁵ E. Haikcal Firdan El-Hady and M. Fauzan Zenrif, "Pandangan Islam Terhadap Etika Kecerdasan Buatan (Artificial Intelligence) Dalam Kehidupan Sehari-Hari," *NUANSA: Jurnal Penelitian Ilmu Sosial dan Keagamaan Islam* 21, no. 2 (December 2024): 84–98, <https://doi.org/10.19105/nuansa.v21i2.16613>.

⁵⁶ Britannica Editors, "Chinese Room Argument," *Encyclopedia Britannica*, March 13, 2025, <https://www.britannica.com/topic/Chinese-room-argument>.

⁵⁸ Melnikova and Surov, "Legal Status of Artificial Intelligence from Quantum-Theoretic Perspective." 5-34.

⁵⁹ Migle Laukyte, "AI as a Legal Person," *The 17th International Conference on Artificial Intelligence and Law, ICAIL 2019*, 2019, 209–13, <https://doi.org/10.1145/3322640.3326701>.

⁶⁰ Rayan Mutairi, "The Legal Status and Inheritance Rights of Sophia The Robot: The Case of Citizenship in Saudi Arabia," *International Symposium On Law, Justice, And Emerging Global Challenges* (North Macedonia), January 21, 2025, 62–74, <https://doi.org/10.55843/ISL2025symp62am>.

granted residency or a certificate as an official resident of the area, namely in Japan.⁶¹ Furthermore, Alicia T was appointed as a member of Tieto's business leadership team in 2016 and has the capacity to vote.⁶² This is similar to the treatment of legal entities (*syakhsiyyah l'tibariyyah*) in contemporary fiqh, which has accepted the existence of legal entities through analogical reasoning (*qiyas*) against entities such as *bait al-mal* and *waqf*, which functionally have separate assets and responsibilities. Similarly, with autonomous AI system, some have proposed granting legal entities the status of electronic persons.⁶³

Based on the three possibilities above, according to the author's understanding, autonomous AI is categorized as a representative (*al-wakil*) in executing a contract that is part of the pillars of *wakalah muqayyadah* (restricted agency).⁶⁴ This is because it is based on various considerations, including that autonomous AI is a human creation that is used as a tool to facilitate various activities such as contract creation. Although autonomous AI can act like humans, it has limitations in that it does not have feelings or contemplation; it only relies on the concentration or logic of what humans have created. In addition, autonomous AI system is also unable to act in the event of unexpected or emergency situations.⁶⁵ Furthermore, the most fundamental issue is that the principles of Islamic contract law cannot be fulfilled by autonomous AI system. In addition, there are concerns that granting autonomous AI legal subject status could be misused to protect humans from responsibility.⁶⁶

3.1.2. The Criteria of *al-'Aqil* and *al-Tamyiz* in Autonomous AI System

The main requirement in performing legal actions such as drawing up contracts is reason and the ability to distinguish between good and bad. Reason is the basis and cause of responsibility; without reason, a contract is void. With reason, humans (*mukallaf*) acquire knowledge related to their legal capacity and their level in *taklifi* law, such as obligatory, sunnah, mubah, makruh, and haram.⁶⁷ Essentially, AI does not have this ability, because its intelligence is artificial, based on algorithms and data analysis, not on consciousness, understanding, or free will. AI cannot understand the meaning of the contracts it executes; it only carries out a series of logical instructions from its creator or user. However, for the sake of convenience in transactions, a conceptual reconstruction in the form of "functional *tamyiz*" can be proposed. which can be defined as the ability to distinguish between beneficial and detrimental actions in the creation of a contract. Thus, well-programmed AI can be said to have this capacity functionally because it is capable of processing data, verifying the fulfillment of encoded conditions, and executing actions that are logically consistent with the purpose of the contract.⁶⁸ The ability of AI to reject incorrect input or input that does not comply with the provisions set out in the contract can be analogized as a form of rejection of disadvantageous transactions.⁶⁹ Despite this, the functional *tamyiz* of

⁶¹ Anonim, "AI 'boy' Granted Residency in Central Tokyo," *The Straits Times* (Tokyo), November 4, 2017, <https://www.straitstimes.com/asia/east-asia/ai-boy-granted-residency-in-central-tokyo>.

⁶² ITWatchIT, "Company Appoints Artificial Intelligence as Member of Leadership Team," *ITWatchIT*, October 18, 2016, <https://itwatchit.com/company-appoints-artificial-intelligence-member-leadership-team/>.

⁶³ Katznelson, "AI Citizen Sophia and Legal Status."

⁶⁴ Muhammad Ali as-Shabuni, *al-Fiqhu al-Syar'i al-Muyassar Juz 2* (Beirut: al-Maktabah al-'Ashriyyah, 2012), 64.

⁶⁵ Soualhi and Saleh, "Smart Contracts and Their Application Prospects in Social Banking."

⁶⁶ Ugo Pagallo, "Vital, Sophia, and Co.—The Quest for the Legal Personhood of Robots," *Information* 9, no. 9 (September 2018): 230, <https://doi.org/10.3390/info9090230>.

⁶⁷ Ramli, "Al-Taftāzānī's Discussion on The Nature of Man Sine Qua Non (Essential) to The Mukallaf in The Science of Uṣūl Al-Fiqh."

⁶⁸ Azlin Alisa Ahmad, Mat Noor Mat Zain, and Nur Diyana Amanina Zakaria, "The Position of Smart Contracts in the Light of Islamic Contract Theory," *Samarah: Jurnal Hukum Keluarga Dan Hukum Islam* 8, no. 1 (January 2024): 144, <https://doi.org/10.22373/sjhk.v8i1.16372>.

⁶⁹ Ahmad, Mat Zain, and Amanina Zakaria, "The Position of Smart Contracts in the Light of Islamic Contract Theory."

autonomous AI is not equivalent to reason, because reason in Islamic law encompasses not only logical ability, but also ethical and moral considerations and awareness of consequences.⁷⁰ Therefore, recognition of functional discernment only serves to legitimize AI execution as part of a larger contract, not to elevate the status of AI to a legal subject equivalent to humans.

Based on the above description, it can be understood that legal capacity is entirely centered on humans. A person's legal eligibility is fundamentally determined by their existence as a living biological human being and by their ability to think and consider rationally. This is where the challenge lies for Artificial Intelligence. As a technological creation, AI does not have biological life or consciousness and reason like humans. Therefore, AI does not fundamentally meet the requirements for legal capacity as understood in the classical Islamic legal tradition. Autonomous AI is not born with responsibility, which is the legal accountability that is naturally inherent in every human being. Consequently, efforts to recognize AI as a legal subject cannot be resolved by simply assigning existing categories of *ahliyyah* to it. Instead, what is needed is a new legal framework, similar to the leap that occurred when the concept of a "legal entity" such as a corporation was first recognized.⁷¹

3.2. The Pursuit of Pillars and Requirements of Smart Contract by Autonomous AI System in Islamic Contract Law

Contracts in Islamic law are referred to as *akad*, which is an agreement or commitment between two or more parties that is realized through *ijab* (offer) and *qabul* (acceptance), which then has legal consequences on the object in accordance with sharia provisions.⁷² Under the legal construction of smart contracts by autonomous AI, there are essential elements and conditions that must be met. Essential elements are fundamental to every agreement or contract, because if they are not met, the contract is invalid or void under the law.⁷³ Hanafi scholars state that the pillars of a contract are the expression of intent through *ijab* (offer) and *qabul* (acceptance), which are collectively referred to as *sighat*. The parties (*'aqidain*) and the object of the contract (*mahal al-'aqd*) are positioned as conditions for the contract or agreement to take place. Conversely, according to *Jumhur Ulama* (majority of scholars), there are four pillars of a contract or agreement, namely the parties to the contract (*al-'aqidain*), the declaration of intent (*sighat al-'aqd*), the object of the contract (*mahal al-'aqd*), and the purpose of the contract (*maqshad al-'aqd*).⁷⁴ If one of these pillars is not fulfilled, then the contract or agreement is invalid.

The differences in the *rukun* (pillars) of a contract among classical scholars appear to have significant relevance in analyzing smart contracts executed by autonomous AI. Referring to the Hanafi scholars, who only have one pillar in a contract, namely *shighat*, opens up room for interpretation that the program code in a smart contract that is executed automatically can be understood as the final manifestation of the *sighat* that has been agreed upon and validated by the parties (humans) when the contract was made and delegated.⁷⁵ Thus, AI does not create new intentions, but only carries out the intentions that already exist in its code, which is a digital representation of the *shighat* that has been created and agreed upon by humans. Conversely, when viewed from the perspective of the *jumhur ulama* (majority of scholars) approach, which requires the presence of the parties (*'aqidain*), then at the time of execution, autonomous AI is not a legal subject that qualifies as *'aqid*.⁷⁶ This shows that the fiqh legitimacy of smart contracts

⁷⁰ Abdul-Latif, Abd, and Mohammed, "The Legitimacy of Relying on Artificial Intelligence and Its Guidelines in Determining Islamic Legal Rulings."

⁷¹ Pagallo, "Vital, Sophia, and Co.—The Quest for the Legal Personhood of Robots."

⁷² Ahmad Syaichoni, *Fikih Muamalah (Konsep Dasar Transaksi Bisnis Islam)*, 1 (Yogyakarta: CV Bintang Semesta Media, 2023), 21.

⁷³ Dewi, Wirdyaningsih, and Barlinti, *Hukum Perikatan Islam Di Indonesia*, 47.

⁷⁴ Doli Witro, Neni Nuraeni, and Muhammad Fauzan Januri, "Classification of Aqad In Sharia Economic Law," *Nurani: Jurnal Kajian Syari'ah Dan Masyarakat* 21, no. 1 (June 2021): 55–68, <https://doi.org/10.19109/nurani.v21i1.8387>.

⁷⁵ Soualhi and Saleh, "Smart Contracts and Their Application Prospects in Social Banking."

⁷⁶ Ahmad, Mat Zain, and Amanina Zakaria, "The Position of Smart Contracts in the Light of Islamic Contract Theory."

executed by autonomous AI is considered easier to establish through the Hanafi approach, which prioritizes the validity of the initial agreement, rather than through the approach of the majority of scholars, which requires the conceptual existence of all *rukun* (pillars) at every stage.⁷⁷

The validity of a contract is not only based on the *rukun* (pillars), but also on a series of *shart* (conditions) that must be met. First, the conditions for the formation of a contract (*syuruth al-in'iqad*), which are conditions attached to the pillars, such as the parties must be *tamyiz* (able to distinguish), the object of the contract must exist and be deliverable, and there must be conformity between the offer and acceptance in one contract meeting. Second, the conditions for the validity of the contract (*syuruth ash-shihhah*), which are conditions that, if not met, render the contract invalid or void even if it has been made, such as coercion, uncertainty, usury, injustice, and others. Third, the conditions for the binding nature of the contract (*syuruth al-luzum*), which are conditions that, once a contract has been made, bind the parties and cannot be unilaterally canceled.⁷⁸

In a contract mediated by autonomous AI through a smart contract, it is essentially the parties who enter into the contract, not the autonomous AI, because it is only a tool for humans that has the sophistication to facilitate the execution of a contract.⁷⁹ Therefore, it is important to know the position of each entity in a smart contract, whether the valid requirements in the contract according to Islamic law have been fulfilled or not. In the smart contract, the entities involved consist of user entities, namely the parties, so they are the ones who must fulfill the legal capacity (*ahliyyah*) requirements, such as being of legal age and of sound mind, and there must be agreement or consent (*'an taradhin*) which is realized when they agree to use the smart contract as a mechanism in the contract.⁸⁰ Then, autonomous AI entities, which function as representatives or execution tools, are not parties to the contract, so their capacity is as a medium or intermediary, not as a party to the contract (*'aqidain*).⁸¹ Furthermore, the developers and owners of the platform are technology service providers or facilitators. They are not directly involved in contracts between users, but they have a legal responsibility to ensure that the platform and smart contract code they create function properly and do not contain anything prohibited by Islamic law.⁸² Their responsibility is more in the nature of product liability or service provider liability. Thus, the use of autonomous AI in contracts can be valid as long as the users have perfect *ahliyyah* and the object of the contract is halal and clear, and the pillars and conditions related to the parties and the object of the contract are also fulfilled.⁸³ This is based on the fiqh rule which states that "the words of a person who is not present at the time of the contract can be represented through his writing."⁸⁴ So, in the context of autonomous AI, this can be done through installed program codes.

3.3. Legal Liability of Autonomous Artificial Intelligence System in Islamic Contract Law

When an autonomous AI executes a smart contract and causes a loss, a legal liability gap emerges. This gap exists because traditional frameworks of liability are ill-equipped to resolve

⁷⁷ Witro, Nuraeni, and Januri, "Classification of Aqad In Sharia Economic Law."

⁷⁸ Munawar, "The Legality of Smart Contract in the Perspectives of Indonesian Law and Islamic Law," *Al-Istinbath: Jurnal Hukum Islam* 7, no. 1 (May 2022): 269, <https://doi.org/10.29240/jhi.v7i1.4140>.

⁷⁹ Munawar, "The Legality of Smart Contract in the Perspectives of Indonesian Law and Islamic Law."

⁸⁰ Hussein 'Azeemi Abdullah Thaidi et al., "Voidable Financial Contracts ('Uqud Fasidah) And The Rectification Mechanisms: A Fiqh Juristic Review," *Journal of Fatwa Management and Research* 29, no. 2 (May 2024): 58–78, <https://doi.org/10.33102/jfatwa.vol29no2.560>.

⁸¹ Xiaoshui Zhai, "Autonomous Systems: How Should Contract Law Treat Such Autonomy?," *Information & Communications Technology Law*, February 12, 2026, 1–29, <https://doi.org/10.1080/13600834.2026.2624924>.

⁸² Lana AL-Khalaileh et al., "Smart Contracts in Light of the Provisions of Islamic Jurisprudence and the Civil Law of Jordan," *Corporate Law & Governance Review* 7, no. 3 (2025): 180–89, <https://doi.org/10.22495/clgrv7i3sip3>.

⁸³ Al-Ifan, "Contract Formation Methods in E-Commerce from Islamic Perspective."

⁸⁴ Enang Hidayat, *Kaidah-Kaidah Fikih Muamalah*, 1 (Bandung: PT Remaja Rosdakarya, 2019), 57.

such scenarios.⁸⁵ The core issue is that the AI itself, being a non-legal entity, cannot be held accountable. It possesses none of the requisite attributes for liability, such as *ahliyyah* (legal capacity), intent, consciousness, or *dhimmah* (a bearer of obligation). Therefore, attributing responsibility to the human principal (designer, producer, or user) for the AI's unforeseeable actions becomes problematic, as it establishes liability in the absence of direct fault.⁸⁶

The debate regarding this legal liability can be further analyzed through the perspective of Islamic contract law, given Islam's nature as a universal religion,⁸⁷ its timeless principles, consistently relevant to evolving circumstances, provide applicable methodologies for resolving contemporary issues, including the question of liability for autonomous AI. Among these methods is the utilization of Qur'anic interpretation and established legal maxims (*al-qawā'id al-fiqhiyyah*) to determine the responsible party. As outlined previously, the parties to a contract must be of sound mind and legal maturity. Consequently, a child who has not yet reached the age of discernment (*mumayyiz*) requires a legal guardian (*wilāyah*) to undertake a juridical act such as contracting. This principle is evident in the Qur'an, which states:

"If the debtor is incompetent, weak, or unable to dictate, let their guardian dictate for them with justice"⁸⁸

From this verse, it can be understood that an individual incapable of performing the legal act of documenting a debt may delegate this task to a trusted party to facilitate their transactional activities. Consequently, an analogy (*qiyas*) can be drawn to an autonomous AI utilized by contracting parties to execute an agreement, serving as a medium to facilitate the contract's performance.⁸⁹ As previously established, the programmed code within a smart contract constitutes a representation of the written form stipulated in the verse. This function is instrumental, among other things, in streamlining contractual execution. Therefore, legal liability reverts to the party employing the autonomous AI, affirming that the AI is merely an instrument acting on the user's behalf.

The first principle, *al-Kharaj bi al-Daman*, establishes that "the right to derive benefit or profit from something is proportionate to the obligation to bear its associated risk or liability".⁹⁰ Consequently, any party that derives a benefit (*kharaj*) from the operation of artificial intelligence whether the developer who sells it, the platform owner who leases it, or the end-user who utilizes it for business must also bear responsibility for any losses it causes. This principle justly links profit with risk. The second principle, *al-Ta'wid 'an al-Dharar*, is a general rule of compensation that mandates redress for any harm inflicted upon another party, whether arising from a breach of contract or an unlawful act. If an AI's actions result in a loss, compensation is obligatory. The question of who bears this liability is precisely addressed by the principle of *al-kharaj bi al-daman*.

By integrating these two principles, a legal framework can be constructed wherein primary liability falls upon the human entity with the greatest control over the AI system be it the owner, user, or developer.⁹¹ However, should the AI operate outside its established parameters for instance, due to being hacked or exhibiting unforeseen behavior contrary to its core programming a legal argument can be made that such actions are *ultra vires* (beyond its authority), and the

⁸⁵ Karolina Ziemianin, "Civil Legal Personality of Artificial Intelligence. Future or Utopia?," *Internet Policy Review* 10, no. 2 (2021): 1–22, <https://doi.org/10.14763/2021.2.1544>.

⁸⁶ Sitiris and Busari, "The Legal Capacity (AI-Ahliyyah) of Artificial Intelligence from an Islamic Jurisprudential Perspective."

⁸⁷ Qur'an, al-Anbiya (21): 106.

⁸⁸ Qur'an, al-Baqarah (2): 282.

⁸⁹ Sitiris and Busari, "The Legal Capacity (AI-Ahliyyah) of Artificial Intelligence from an Islamic Jurisprudential Perspective."

⁹⁰ Imam Jalaluddin Abdurrahman As-Suyuti, *Al-Asybah Wa al-Nazair* (Beirut: Dar al-Kutub al-Ilmiyah, 1983), 135–136.

⁹¹ Zainal Habib, "Ethics of Artificial Intelligence in Maqāsid Al-Sharī'a's Perspective," *KARSA: Jurnal Sosial Dan Budaya Keislaman (Journal of Social and Islamic Culture)* 33, no. 1 (June 2025): 105–34, <https://ejournal.uinmadura.ac.id/index.php/karsa/article/view/19617>.

principal is not automatically liable.⁹² Consequently, the AI's programming itself can be treated as a delegated agent.⁹³ The functions, limitations, and objectives encoded within it provide an objective and auditable basis for determining the principal's scope of liability.⁹⁴ If a loss arises from the program's execution as designed, the principal is responsible. Conversely, if the loss stems from ambiguous or unforeseeable actions that violate its coded constraints, liability may be negated for the principal.

Beyond the application of legal maxims, classical Islamic jurisprudence has developed a framework of liability for non-rational entities under human control, which can be strongly analogized to the case of artificial intelligence:⁹⁵ the first is the analogy with the Owner of an Animal. In Islamic law, the owner of an animal is liable for damage caused by it, particularly if the damage occurs at night or results from the owner's negligence in its supervision. The animal itself cannot be held accountable. Similarly, an AI, as a "digital animal" released into the cyber ecosystem, becomes the responsibility of its owner or user.

The second analogy is with a Slave Authorized to Trade (*'Abd al-Ma'dhun*) by his master. The most precise and robust analogy is to the status of the *'abd al-ma'dhun*. In classical jurisprudence, a slave in this status is granted permission by his master to conduct commercial transactions, thereby possessing the capacity to perform legally binding acts of sale and purchase on his master's behalf. He is considered to have *ahliyyah al-ada' al-naqisah* (a deficient executive capacity) specifically for these transactions. Although his actions are valid and binding, he (the slave) lacks an independent legal capacity for liability (*dhimmah*). All debts and liabilities arising from his transactions are the full responsibility of his master. The slave is a competent agent for action, but not for bearing liability. This model perfectly maps the relationship between an AI and its principal. This analogy can be applied to an autonomous AI that possesses "authorization" through its code to act, yet lacks a *dhimmah*. Consequently, all legal responsibility is automatically transferred to its "master" the owner or user who deployed it. In the study of *usul al-fiqh*, such an analogy is termed *qiyas musawi*, as the legal ruling applies equally to the new case (*furu'*) and the original case (*ashal*) due to the identical strength of the effective cause (*'illah*).⁹⁶

The concept of *Dhaman al-Milkiyyah* (Liability of Ownership) affirms that legal liability is inherent in ownership. An individual who owns an asset also bears the risk inherent to that asset. An autonomous AI system, in its current legal status, is considered an asset or property. Consequently, the owner of the AI directly assumes liability for all actions and losses caused by their property. This principle reinforces the conclusion of the prior analysis. Whether viewed as a tool, an agent, or property, an autonomous AI system cannot be the ultimate subject of liability. The chain of liability invariably terminates with a human entity possessing full legal capacity (*ahliyyah al-ada' al-kamilah*) and the capacity for accountability namely, the owner, developer, or user who controls it.⁹⁷

3.4. The Legal Determining of Autonomous AI System in Islamic Contract Law

Based on the preceding analysis, the status and liability assigned to parties for actions performed by autonomous AI system, from an Islamic legal perspective, can be structured using

⁹² Mohammad H. Bashayreh, Amer Tabbara, and Fadi N. Sibai, "The Need for a Legal Standard of Care in the AI Environment," *Sriwijaya Law Review* 7, no. 1 (2023): 73–86, <https://doi.org/10.28946/slrev.vol7.iss1.1507.pp73-86>.

⁹³ Daniel Seng and Tan Cheng Han, "Agency Law and AI," in *The Cambridge Handbook of Private Law and Artificial Intelligence*, ed. Ernest Lim and Phillip Morgan, Cambridge Law Handbooks (Cambridge: Cambridge University Press, 2024), 250–69, <https://doi.org/10.1017/9781108980197.013>.

⁹⁴ Paulo Henrique Padovan, Clarice Marinho Martins, and Chris Reed, "Black Is the New Orange: How to Determine AI Liability," *Artificial Intelligence and Law* 31, no. 1 (2023): 133–67, <https://doi.org/10.1007/s10506-022-09308-9>.

⁹⁵ Yaprntsev, Khmelevskoi, and Kalashnikov, "AI through the Prism of Its Legal Personality."

⁹⁶ Amir Syarifuddin, *Ushul Fiqh 1*, 1st ed. (Jakarta: Kencana, 2011), 176–77.

⁹⁷ Norah Alfulij et al., "Medical Errors in Robotic Surgery in Islamic Jurisprudence and Law," *2024 Seventh International Women in Data Science Conference at Prince Sultan University (WiDS PSU)*, March 3, 2024, 116–20, <https://doi.org/10.1109/WiDS-PSU61003.2024.00036>.

the principle of *wakalah muqayyadah* (restricted agency) in Islamic jurisprudence. This is grounded in the general permissibility governing all transactional dealings (*mu'amalat*). *Wakalah muqayyadah* refers to the substitution or delegation of authority by one person to another for specific, pre-defined matters, allowing the agent to perform only those predetermined and limited acts.⁹⁸ Simply understood, it is a contract whereby a person entrusts a delegable action to another party to be executed according to specified terms.⁹⁹ The concept of *wakalah* (whether absolute or restricted) is essential for human society, as individuals cannot personally perform all actions and thus must delegate to others. Human capability is inherently limited; not all people possess the same skills, and each has unique strengths and weaknesses.¹⁰⁰ Consequently, people require the assistance of other parties to facilitate their activities.¹⁰¹ This aligns with the religious principle that Islam is a faith intended to facilitate ease, not hardship. In the contemporary context, the delegation of authority to conduct specific activities, such as contracting, extends not only to other humans but also to autonomous artificial intelligence. Indeed, the outcomes produced by such AI can, in many cases, surpass the results achieved by humans.

With reference to the pillars and conditions of *wakalah* (agency), an autonomous AI fundamentally fails to meet the criteria to serve as a legal agent for a delegated act. This is due to one inherently irrelevant condition: an autonomous AI system lacks intellect (*'aql*), whereas a classical fiqh is required to be rational and possess discernment (*mumayyiz*).¹⁰² The author posits that the requirement for *al'aql* and *mumayyiz* is intended to ensure the agent's capacity to understand and execute its contractual duties and obligations as intended. If observed, an autonomous AI is capable and often superior in executing the tasks and obligations as commanded or encoded within it to perform a contract. Therefore, provided the autonomous AI system can execute its tasks and uphold its mandate in accordance with its programming, it can validly function as an agent for contract execution. This condition can be analogized to a child who has not yet reached the age of discernment (*mumayyiz*), whereby certain acts must be conducted by a guardian on their behalf, while other acts do not require such representation.

The application of the *wakalah muqayyadah* concept is based on legal derivation (*istinbath*) through analogy or *qiyas*, as previously outlined. *Qiyas* is a method of employing reasoned opinion (*ra'yu*) to derive Sharia rulings for matters not explicitly regulated by the Qur'an and Hadith.¹⁰³ The use of *qiyas* as source of law is based on the Qur'an, surah An-Nisa, verse 59. This is further explained by Imam Shafi'i in his book "Al-Risalah" that the phrase "obey Allah and obey the Messenger" refers to the Qur'an and Hadith as source of Islamic law. The phrase "those in authority among you" refers to *ijma'* as a source of law. Mean while, the phrase "if you differ in anything, refer it to Allah (the Qur'an and the Messenger [Hadith])" refers to *qiyas* as a source of Islamic law.¹⁰⁴ Its application may be grounded in the Qur'an and Hadith, or it may operate more freely by examining the logical reason (*'illah*) and the underlying similarity between two entities created by God. If the two entities share the same essential attribute, then they share the same legal ruling.¹⁰⁵ *Qiyas* is categorized into several types depending on the perspective, one of which is based on the aspect of the strength of the *'illah* found in the new case (*faru'*) compared to that found in the original case (*ashal*), namely:¹⁰⁶

- a. *Qiyas awlawi* (a fortiori analogy), where the legal ruling applies more strongly to the new case (*faru'*) than to the original case (*ashal*). An example is the prohibition of striking one's parents

⁹⁸ Hariman Surya Siregar and Koko Khoerudin, *Fikih Muamalah (Teori Dan Implementasi)*, 1 (Bandung: PT Remaja Rosdakarya, 2019), 244.

⁹⁹ Syaichoni, *Fikih Muamalah (Konsep Dasar Transaksi Bisnis Islam)*, 21.

¹⁰⁰ Qur'an, al-Hujurat (49): 13.

¹⁰¹ Qur'an, al-Maidah (5): 2.

¹⁰² Ibnu Rusyd, *Bidayatul Mujtahid*, vol. 2, ed. Ahmad Abu Al-Majdi (Surakarta: Pustaka Azzam, 2007), 595–596.

¹⁰³ Abdul Wahab Khalaf, *Ilmu Ushulul Fiqh*, vol. 2, trans. Masdar Helmy (Cairo: Da'wah Islamiyah Syabab al-Azhar, 1968; repr., Bandung: Gema Risalah Press, 1997), 92–93.

¹⁰⁴ Muhammad ibn Idris As-Syafi'i, *Al-Risalah* (Beirut: Dar al-Kutub al-Ilmiyah, n.d.), 81.

¹⁰⁵ Satria Efendi M. Zein, *Ushul Fiqh*, 7 (Jakarta: Kencana, 2017), 118.

¹⁰⁶ Syarifuddin, *Ushul Fiqh* 1, 237.

being deduced from the Qur'anic prohibition of even saying "*uff*" (an expression of contempt) to them.¹⁰⁷ Thus, if verbal disrespect is forbidden, then physically striking them is, by a stronger reason, also forbidden.

- b. *Qiyas musawi* (analogy of equivalence), where the legal ruling applies to the new case (*far'*) with the same strength as it does to the original case (*ashal*) due to an equivalent effective cause (*'illah*). An example is equating the burning of an orphan's property with the consumption of it in a wrongful manner, thereby applying the same legal consequence.¹⁰⁸
- c. *Qiyas adna* (analogy of inferiority), where the legal ruling applies less strongly to the new case (*furu'*) than to the original case (*ashl*), even though the analogy meets the formal requirements. An example is the intoxicating effect of beer being considered less potent than that of *khamr* (a specific type of wine), potentially resulting in a less severe legal ruling.¹⁰⁹

Of the three types of *qiyas* outlined above, the analogy employed to analyze and assign liability for autonomous AI through the concept of *wakalah muqayyadah* is *qiyas adna* (the analogy of inferiority). This is because an autonomous AI system possesses inherently inferior qualities and status when compared to a slave who possesses intellect. Although an autonomous AI system may exhibit behavior that appears superficially human-like, it cannot be equated to a human legal subject. The AI is analogized with a slave solely to affirm its dependent nature and subordinate status relative to humans, specifically its user. Consequently, legal liability is transferred to the human (owner), mirroring the responsibility of a master for his slave in classical fiqh.

Table 2.
The structure of argumentative

Qiyas Elements	Slave ('abd)	Autonomous AI System
<i>Ashal</i> (original case)	Act's under the master's control	-
<i>Furu'</i> (new case)	-	Acts through programmed algorithms
<i>'illah</i> (effective case)	Dependence on the owner's will & limited legal capacity	Dependence on its programmer/user and the inexistence of 'aql and tamyiz in the sharia sense
<i>Hukm</i> (legal ruling)	Liability is assigned to the master	Liability is assigned to the AI's owner or creator
Category	<i>Qiyas adna</i> (Analogy of inferiority) based on the 'illah in the furu' (the absolute absence of 'aql) is weaker than 'illah in the ashl (restricted 'aql)	

Source: Author analysis, 2025

Based on the table above, the slave acting under the master's control serves as the original case (*ashal*), which possesses feeling or contemplation due to having 'aql, while the autonomous AI acting through its algorithms constitutes the new case (*furu'*), which lacks contemplation due to the absence of 'aql. However, both still share the effective cause (*'illah*) of dependence the slave on the master, and the AI on its owner/user/programmer. Consequently, the resulting legal ruling (*hukm*) is that liability is assigned to the owner. In the study of *usul al-fiqh*, specifically concerning analogical reasoning, this is classified as *qiyas adna* (analogy of inferiority), as the legal status of the original case (*ashl*) is inherently stronger than that of the new case (*furu'*).

In Islam, a slave ('abd), although under the ownership of his master and having limited legal capacity, remains a human being who possesses 'aql (intellect) and *tamyiz* (the ability to distinguish) because humans are God's finest creation among all other creatures.¹¹⁰ Thus, the

¹⁰⁷ Qur'an, al-Isra' (17): 23.

¹⁰⁸ Qur'an, an-Nisa (4): 2.

¹⁰⁹ Qur'an, al-Maidah (5): 90.

¹¹⁰ Qur'an, At-Tin (95): 5.

'illah that his legal liability shifts to his master is not due to the absence of *'aql*, but rather the absence of freedom (*hurriyah*). A slave, because being rational, still possesses a limited capacity for action (*ahliyyah al-ada*), which allows him to understand the basic consequences of his actions, and he can even be subjected to criminal penalties for his own deeds.¹¹¹ In terms of transactions, he can act as a representative for his master, and his actions are considered valid legal actions as long as it is within the limits of permission.¹¹² The will is constrained by his legal status, not due to a lack of cognitive capacity. Thus, he can still understand the basic consequences of his actions, even though he bears the financial burden.

On the contrary, autonomous AI system do not possess *'aql* in the sharia sense at all. It does not possess consciousness, intention, or moral understanding.¹¹³ Its actions are purely the result of mathematical computations from data and algorithms, because it is not a legal subject, but rather a tool.¹¹⁴ If a slave still has the potential to be free and become a full legal subject, an autonomous AI system does not have such ontological potential. The *'illah* of autonomous AI system is its total dependence on programmers and the absolute absence of *'aql*, which is fundamentally much weaker compared to the *'illah* of a slave who still possesses reason even when bound, but has the potential for freedom. It can be said that slaves are in the layer of *insan naqis al-ahliyyah* (humans with diminished capacity), whereas autonomous AI systems are in the layer of *al-shya'* (object).

Based on the ontological consideration, the appropriate analogy to use is *qiyas adna* because the law of the *ashl* is stronger than the law of the *furu'*. In other words, if the civil liability of a slave who still has reason can be transferred to its master, then in the case of autonomous AI system that is completely devoid of reason, the transfer of liability to the owner or user is a legal necessity that is stronger in logical analogy. The application of this type of *qiyas adna* brings legal consequences that result in ruling that the *furu'* law is qualitatively weaker compared to the ruling in the original legal case. This consequence can be divided into three parts, as follows:

First, the aspect of the burden of proof and legal presumption. In the case of an *'abd al-ma'dhun*, since this person has *'aql*, there is room to assess whether he acted within the limits of his master's permission or exceeded them (*ta'addi*). If he exceeds the limits of permission such as trading in prohibited goods or engaging in transactions forbidden by sharia, then he may be held personally liable, with the fulfillment of this liability deferred until he gains his freedom (*yutba' bihi ba'da al-'itq*).¹¹⁵ Conversely, autonomous AI system lacks the capacity to act beyond the limits of authorization in a conscious and responsible manner.¹¹⁶ All of its actions, even those beyond prediction, are direct consequences of the code programmed by humans. Therefore, the legal presumption (*ashl*) shifts that every harmful action by an autonomous AI is automatically attributed to the programmer or user without the need to prove the presence of intent or

¹¹¹ Muhammad ibn Qasim ibn Muhammad Al-Ghazi ibn Al-Gharabali Abu Abdillah, *Fath al-Qarib al-Mujib Fi Sharh Alfaz al-Taqrir Aw al-Qawl al-Mukhtar Fi Sharh Ghayat al-Ikhtisar* (Beirut: Dar ibn Hazm, 2005), 281.

¹¹² Fatma Kuru, "Kitabat (Mukataba) Contract in Islamic Law and Its Practice in the Ottoman Empire," *Ankara Universitesi İlahiyat Fakültesi Dergisi* 64, no. 2 (2023): 407–40, <https://doi.org/10.33227/auifd.1297359>.

¹¹³ Gianfranco Basti and Giuseppe Vitiello, "Deep Learning Opacity, and the Ethical Accountability of AI Systems. A New Perspective," in *The Logic of Social Practices II*, vol. 68, ed. Robert Lowe and Raffaella Giovagnoli (Springer, 2023), 21–73, https://doi.org/10.1007/978-3-031-39113-2_2.

¹¹⁴ Vincenzo Calderonio, "Cause and effect of artificial intelligence: on the legal nature of AI output and its impact on the liability regime," *Rivista Italiana di Informatica e Diritto* 8, no. 1 (2026): 19, <https://doi.org/10.32091/RIID0267>.

¹¹⁵ Mohammad Amin Ghoochani Gharawi, "The Ethics of Slavery in Islam: Addressing the Doubts," *Religious Inquiries* 13, no. 2 (2024): 115–30, <https://doi.org/10.22034/ri.2024.389542.1722>.

¹¹⁶ Mahayaudin M. Mansor et al., "Discrepancy and Thematic Bibliometric Analyses of the Remaining Limitations in Artificial Intelligence," *IEEE International Conference on Computing (ICOCO)*, 2024, 485–90, <https://doi.org/10.1109/ICOCO62848.2024.10928174>.

negligence on the part of the AI system itself. There is no concept “AI error” that can mitigate human liability, because AI system lacks the capacity to be “at fault” in the legal sense.¹¹⁷

Second, the scope and type of liability. Because the *‘illah* is AI system is weaker, the level of liability imposed on the human (*muwakkil*) is stricter and broader. In the case of a slave, the master’s liability is limited to losses arising within the scope of the granted permission, and if the slave acts beyond that permission, liability may shift partially to the slave. However, for autonomous AI systems, since the absence of *‘aql* makes it impossible for them to possess intent or consciousness, any loss caused by the execution of a smart contract even those resulting from bugs or algorithmic prediction errors remains the liability of the human operating it. The standard of due diligence required of users of autonomous AI system become higher. Humans cannot hide behind the pretext of machine autonomy to absolve themselves of liability for damages,¹¹⁸ because methodologically, *qiyas adna* has established that the authority of the machine is inherently lower and entirely derivative of human authority.

Third, the hierarchical and flexible aspects of Islamic law. The use of *qiyas adna* places the resulting law at the level of *zanni al wurud wa al-dalalah* (strongly presumptive but not absolute). This means that the concept of *wakalah muqayyadah* for autonomous AI system is not an unchangeable, definitive ruling. It is the result of *ijtihad* relevant to the current technological context, yet open to revision as AI sophistication advances in the future.¹¹⁹ If one day AI system is proven to possess consciousness equivalent to human *‘aql*, then the *qiyas* classification may shift to *qiyas musawi* or even *qiyas awlawi*, with different legal implication. Thus the acknowledgment of the limitations of this *qiyas adna* ruling actually reflects the principles of *taysir* (ease) and *murukah* (flexibility) in *fiqh*, which allow Islamic law to respond to the dynamics of the times without losing its methodological grounding.

3.5. A Multi-party Liability Model for Autonomous AI System in Islamic Smart Contract

Previous analyses have established that when an autonomous AI acts as restricted agent in a smart contract, legal liability for any resulting losses falls back on the principal who exercises dominant control over system. However, what if the loss is not caused by the user, but rather by the fault of another entity such as the developer who wrote the underlying code, the platform operator providing the infrastructure, the validator/node operator processing the transaction, and even the external data provider (oracle) supplying the information that triggers the contract’s execution? In a multi-party context where no single party holds full control, determining the legal entity responsible for such losses creates confusion regarding liability.

To address this issues, there are two concepts in Islamic jurisprudence that can be applied within the framework of *wakalah muqayyadah*, namely the concept of *kafalah* (guarantee) as a mechanism for allocating individual responsibilities among parties, and the concept of *takaful* (joint liability) as a mechanism for collective guaranty when individual allocation is not possible.¹²⁰ These two mechanisms do not replace the framework of *wakalah muqayyadah*, but rather strengthen its practical application in complex multiparty context.

3.5.1. *Kafalah* as Mechanism for Allocating Responsibility Among Parties

¹¹⁷ Raul Hakli and Pekka Mäkelä, “Robots, Autonomy, and Responsibility,” in *What Social Robots Can and Should Do*, vol. 290, ed. Johanna Seibt, Marco Nørskov, and Søren Schack Andersen (IOS Press Ebook, 2016), 145–54, <https://doi.org/10.3233/978-1-61499-708-5-145>.

¹¹⁸ Sjur Dyrkolbotn, Truls Pedersen, and Marija Slavkovik, “Classifying the Autonomy and Morality of Artificial Agents,” *CEUR Workshop Proceedings* 2051 (2018): 67–83, <https://hdl.handle.net/11250/3607170>.

¹¹⁹ Mohammad Rachid Aldershawi, “The Nature of Qiyās Al-Adna, Objections about It and Its Applications According to the Scholars of Uṣūl al-Fiqh,” *Cumhuriyet İlahiyat Dergisi* 27, no. 1 (2023): 136–49, <https://doi.org/10.18505/cuid.1249656>.

¹²⁰ Hafiz Ali Hassan, “Takaful Models: Origin, Progression and Future,” *Journal of Islamic Marketing* 11, no. 6 (2020): 1801–19, <https://doi.org/10.1108/JIMA-04-2018-0078>.

Kafalah in Islamic law is a guaranty contract in which a guarantor (*kafil*) commits to bearing the obligations of another party (*makful 'anhu* or *ashil*) to a third party (*makful lahu*).¹²¹ The legal basis for *kafalah* is found in the Qur'an that describe a commitment to assume obligations and guarantee responsibility.¹²² This is clearly evident when a binding pledge is required to ensure the safety and return of a person entrusted to another's care, which demonstrates the legal and moral responsibility of the guarantor. As well as the Prophet's hadith stating that "the guarantor is responsible for their guaranty".¹²³ Operationally, National Sharia Council-Indonesian Ulama Council Fatwa No. 11/DSN-MUI/IV/2000 on *Kafalah* stipulates that this contract is valid and binding, where the *kafil* can receive compensation (fee) as long as it is not burdensome, and the contract is customary (binding) and cannot be unilaterally canceled. In the context of blockchain-based smart contracts, the *kafalah* mechanism can be adapted to solve the problem of multi-party responsibility allocation through the following stages:

- a. Identify the party that holds the greatest degree of control within each operational layer. In any given smart contract, the parties involved are not homogeneous. The code developer bears the greatest responsibility for programming logic errors or bugs that result in loss; the end user bears the greatest responsibility for incorrect input parameters or misuse of contract functions; the platform operator bears the greatest responsibility for infrastructure failures that cause contract execution to be delayed or to fail; and the oracle provider bears the greatest responsibility for inaccurate data that triggers erroneous execution. The principle of *al-ghurm bi al-ghunm* (liability commensurate with benefit) serves as the foundation for this allocation: each party bears responsibility in proportion to the benefit it derives from its respective role.¹²⁴
- b. Tiered application of *kafalah* (suretyship). Each party in the operational chain of a smart contract acts as a *kafil* (guarantor) for the quality and security of its respective contribution. The code developer acts as a *kafil* for the technical functionality of the contract; if the code contains hidden defects that cause loss, the developer is obligated to pay compensation based on the principle of *daman al-maqabid* (liability for anything under one's control). The end user acts as a *kafil* for the accuracy of the input data they provide. The platform operator acts as a *kafil* for the availability and security of the infrastructure they supply. This tiered *kafalah* model enables the injured party to specifically identify the party most responsible for the harm, while simultaneously preventing any party from shifting blame to another. Technically, the smart contract itself can be programmed to automatically record and execute these *kafalah* clauses, thereby creating a self-executing guarantee system. As noted in a recent study, "Smart contracts enable the *kafalah* contract to be encoded automatically. If the guaranteed party fails to fulfill its obligations, the system directly executes the guarantor's liability."

3.5.2. *Takaful* as an Instrument of Joint Responsibility in Conditions of Uncertainty

Although tiered *kafalah* provides a clear allocation mechanism, there are scenarios in which the cause of loss cannot be definitively attributed to any single party, for example, when a loss arises from the complex interaction between code, oracle data, and unpredictable market conditions, without any demonstrable element of fault on the part of a particular party. In such situations, Islamic law offers the mechanism of *takaful* (joint responsibility / mutual guarantee).

Etymologically, *takaful* derives from the word *kafala*, which signifies joint responsibility or mutual guarantee among parties.¹²⁵ In contemporary Islamic economic practice, *takaful* is known as the concept of sharia-compliant insurance, founded upon the contracts of *tabarru'* (voluntary

¹²¹ Andi Soemitra, *Hukum Ekonomi Syariah Dan Fiqh Muamalah Di Lembaga Keuangan Dan Bisnis Kontemporer*, 1 (Jakarta: Kencana, 2019), 127–28.

¹²² Qur'an, Yusuf (12): 66 and 72.

¹²³ Muhammad ibn 'Isa al-Tirmidzi, *Jami' al-Tirmidzi*, 3 (Mesir: Mustafa al-bab al halabi, 1975), 604.

¹²⁴ Nasrun Mohamad Ghazali et al., "Fiqh Maxim of 'al-Ghurm Bi al-Ghunm': A Critique on the Interpretation of the Maxim Relating to Risk-Return Concept in Islamic Banking and Finance," *ISRA International Journal of Islamic Finance* 16, no. 2 (2024): 4–19, <https://doi.org/10.55188/ijif.v16i2.412>.

¹²⁵ Hassan, "Takaful Models."

contribution/charity) and *ta'awun* (mutual assistance),¹²⁶ as affirmed in the relevant fatwa issued by the National Sharia Council of the Indonesian Council of Ulama (DSN-MUI). However, the essence of *takaful* as a principle of joint responsibility is not limited to insurance alone; it is a fundamental principle that can be extended into the contractual domain. As explained in the literature, *takaful* embodies three dimensions of collectivity: mutual cooperation/assistance, mutual responsibility, and mutual protection against adversity.

In the context of blockchain-based smart contracts, *takaful* can be operationalized through the following mechanism:

- a. Establishment of a common fund. Prior to the execution of the smart contract, each party involved in the contract ecosystem, developers, users, platform operators, and validators, contributes to a common fund managed by the smart contract itself. Such contributions are proportional, based on the level of risk and benefit received by each party. This fund serves as a collective safety net, to be used to compensate victims for losses in the event of a system failure that cannot be specifically attributed to any particular party.
- b. Principle of *ta'awun* (mutual assistance). This mechanism is grounded in the words of Allah in Surah Al-Ma'idah [5:2]: "*And cooperate in righteousness and piety, but do not cooperate in sin and transgression.*" This principle establishes that the parties to a smart contract are bound not only by bilateral contractual relations but also by a moral and legal responsibility to protect one another from loss.
- c. Combination with *kafalah bi al-dayn* (guarantee of debt). In scenarios where a loss occurs and cannot be attributed, the *takaful* fund is used to compensate the victim. This aligns with the application of *kafalah bi al-dayn* (suretyship for a debt obligation) in *takaful* insurance, whereby participants collectively act as *kafil* (guarantors) to cover liabilities arising from a misfortune that befalls any one of the participants.

3.6. Liability for Autonomous AI system: A Global Perspective

The use of autonomous AI systems in decision-making poses challenges to conventional legal systems, which are fundamentally designed to govern human legal subjects and legal entities. The absence of regulation addressing this issue has prompted progressive steps by various countries, given that autonomous AI systems already operate in a manner resembling the actions of legal subjects in general. The following are several countries that have enacted legislation in response to the development of such autonomous AI systems.

3.6.1. European Union

The EU Artificial Intelligence Act (EU AI Act 2024/1689) is a legal instrument specifically regulating AI. This regulation adopts a risk-based approach, whereby the higher the risk level of system, the greater the compliance burden borne by actors within AI system chain.¹²⁷ Liability is allocated linearly along the value chain, with emphasis on transparency, accountability, and meaningful human oversight. Under this legislation,¹²⁸ AI risk systems are classified into four tiers, each carrying distinct legal consequences and enforcement mechanisms.¹²⁹

¹²⁶ Mervyn K. Lewis, "The Evolution of Takaful Products," in *Islamic Capital Markets: Products and Strategies*, ed. M. Kabir Hassan and Michael Mahlke (Wiley, 2015), 185–99, <https://doi.org/10.1002/9781119206040.ch9>.

¹²⁷ Mikolaj Firlej, "Autonomous Systems, Legal Boundaries," in *Elgar Concise Encyclopedia of Artificial Intelligence and the Law*, ed. Ryan Abbott and Elizabeth Rothman (Edward Elgar Publishing Ltd., 2025), 48–51, <https://doi.org/10.4337/9781035336906.00018>.

¹²⁸ Markus Mueck, Christophe Gaie, and Dimitris C. Gkikas, "Introduction to the European Artificial Intelligence Act," in *European Digital Regulations*, vol. 265, ed. Markus Mueck and Christophe Gaie (Springer, 2025), 53–90, https://doi.org/10.1007/978-3-031-80809-8_3.

¹²⁹ David Krause, "The EU AI Act and the Future of AI Governance: Implications for U.S. Firms and Policymakers," in *Artificial Intelligence and the Rule of Law: The Age of Legal Tech and Digital Governance in a Fractured Digital World*, ed. Armando Aliu (Cham: Springer Nature Switzerland, 2025), 239–68, https://doi.org/10.1007/978-3-031-97389-5_9.

First category, unacceptable risk. This category encompasses practices absolutely prohibited under Article 5 of the AI Act, including the use of AI for social scoring, subliminal manipulation, and real-time remote biometric identification for law enforcement purposes. Operators who violate these provisions face severe sanctions in the form of maximum administrative penalties. Moreover, such violations may serve as *prima facie* evidence in civil litigation, significantly weakening the operator's legal position before the courts.¹³⁰

Second category, high risk. This applies to AI system implemented in critical sectors such as infrastructure, education, human resource management (including recruitment), and credit assessment, as listed in Article 6. For this category, the regulation mandates strict compliance with the governance standards set forth in Articles 8-15, covering data governance, technical documentation, and consistent human oversight. The most significant legal implication in this category is the emergence of a presumption of product defect under the Product Liability Directive (PLD) whenever safety standards are violated, thereby facilitating claimants' ability to hold operators liable for resulting harm.¹³¹

Third category, limited risk. This involves human-interaction systems such as chatbots, deepfakes, and emotion recognition technologies. The primary regulatory focus at this level is transparency obligations under Article 50, whereby operators must ensure that users are aware they are interacting with an AI. Failure to meet these transparency obligations is not merely an administrative violation but may also be categorized as consumer deception or fraud.¹³²

Fourth category, minimal risk. This covers general applications such as spam filters or AI-based games. The AI Act provides no specific regulation for this category, as it is deemed to pose a low threat to fundamental rights.¹³³ Consequently, the legal liability regime for operators in this category depends entirely on the general tort law provisions of individual Member States.

The above distinction among risk tiers also results in a differentiated distribution of responsibilities borne by each actor. The Act further distinguishes five main categories of actors, each with distinct obligations corresponding to their position in the AI system lifecycle.¹³⁴

First, the provider, an entity whether a natural or legal person, that develops an AI system. Providers bear the heaviest *ex-ante* (pre-marketing) compliance burden. They are fully responsible for ensuring that high-risk AI systems meet the requirements of Articles 8–15, including data governance, technical documentation, and human oversight. The assurance mechanisms include mandatory conformity assessment, affixing the CE marking, and registering the system in the EU database. If a systemic failure occurs later, the provider becomes the primary target of administrative audits.

Second, importers and distributors, they act as compliance filters to ensure that only lawful products circulate in the EU market. Under Article 23, importers are obligated to verify that non-EU providers have appointed an authorized representative and have conducted a proper conformity assessment. They are also responsible for ensuring that storage or transport conditions do not compromise the system's compliance. Distributors, under Article 24, have obligations of visual and documentary verification, such as ensuring the CE marking is present and that instructions for use are available. If they discover non-compliance, they are prohibited from placing the product on the market and must report to the authorities.

¹³⁰ Rostam J. Neuwirth, "Prohibited Artificial Intelligence Practices Revisited," in *The European Artificial Intelligence Act*, vol. 78, ed. Vera Lucia Raposo, Law, Governance and Technology Series (Springer Nature, 2025), 131–55, https://doi.org/10.1007/978-3-031-98406-8_6.

¹³¹ Jersain Llamas Covarrubias and Celina Díaz Michel, "Guiding Principles to Address Cybersecurity Requirements for High-Risk AI Systems Under the AI Act," in *Reshaping: Criminology with AI*, ed. Fernando Ortiz-Rodriguez et al. (New York: IGI Global, 2025), 35–62, <https://doi.org/10.4018/979-8-3693-8871-6>.

¹³² Krause, "The EU AI Act and the Future of AI Governance."

¹³³ Krause, "The EU AI Act and the Future of AI Governance."

¹³⁴ Dariusz Szostek and Rafał Tomasz Prabucki, "High-Risk AI Systems," in *The European Artificial Intelligence Act*, vol. 78, ed. Vera Lucia Raposo, Law, Governance and Technology Series (Springer Nature, 2025), 157–80, https://doi.org/10.1007/978-3-031-98406-8_7.

Third, the deployer, as stated in Article 26, an entity that uses an AI system in a professional capacity. Deployers are required to use the AI system safely and in accordance with its intended purpose. Furthermore, they are obligated to report any serious risks or incidents; they must immediately suspend use and inform the provider and market authorities. The same article further provides that deployers bear responsibility if harm results from negligence in operation, including use contrary to instructions, errors in human oversight, incorrect input data, or failure to halt operations.

Based on this classification of actors in the AI Act regime, legal liability is clearly delineated, as each actor's capacity and obligations are specified.¹³⁵ However, liability becomes joint where a deployer, importer, or distributor is deemed to be a provider because it has done any of the following:

1. Placing its own brand by affixing its own name or trademark to an AI system already placed on the market (Article 25(1)(a))
2. Substantial modification by making significant changes to the architecture or functionality of a high-risk AI system already in circulation (Article 25(1)(b))
3. Change of intended purpose by altering the intended use of an AI system such that it becomes high-risk where it was not originally (Article 25(1)(c)).

This provision is critically important for companies engaged in white-labeling or integrating third-party AI systems. When an entity affixes its logo or modifies how an autonomous AI operates, it inherits a heavy burden of legal responsibility, including the obligation to conduct a conformity assessment and to register in the EU database. This creates a strong economic incentive not to make reckless modifications and to ensure robust indemnity contracts among supply chain actors.

3.6.2. UNCITRAL Model Law on Automated Contracting

UNCITRAL Model Law on Automated Contracting (MLAC), adopted on July 11, 2024, is built upon three principles: technology neutrality, non-discrimination against the use of electronic means, and party autonomy.¹³⁶ MLAC explicitly states that an automated system is merely a tool, possessing neither independent will nor legal personality.¹³⁷ Consequently, because an automated system is classified as a tool, liability is attributed to the parties as legal subjects.

The liability provision is based on an attribution mechanism, namely a method of determining who is responsible for the output of an automated system by linking it to a legal subject. Article 7(1) establishes that the actions of an automated system are attributed in accordance with the procedure agreed to by the parties. This means that the parties themselves may determine how attribution is to be carried out through an agreement or through the platform they have mutually accepted. For example, if the parties have agreed that the actions of an autonomous AI system are to be attributed to Party A, then Party A shall bear responsibility. However, in the absence of such an agreement, the applicable method is attribution based on use the fallback rule. Article 7(2) states that the fallback rule provides that the actions of an automated system are attributed to the person who uses the system for that purpose, based on the strongest connection of the user to the action.

To determine whether a user has a strong connection with the action of an autonomous system, paragraph 66 lists relevant indicators, including: (a) who deployed the system; (b) who has control over the operational parameters; (c) who derives a benefit or economic value from the action; (d) the nature and purpose of the contract; and (e) the trade customs and practices prevailing between the parties. By examining these indicators through the strongest link to the action that gave rise to the error, the party responsible in the absence of any contractual

¹³⁵ Karolina Kiejnisch-Kruk, "Obligations of Importers, Distributors and Deployers of High-Risk AI Systems under the AI Act," *Ius Novum* 19, no. 4 (December 2025): 121–40, <https://doi.org/10.2478/in-2025-0040>.

¹³⁶ United Nations Commission on International Trade Law, *UNCITRAL Model Law on Automated Contracting with Guide to Enactment* (Vienna: United Nations, 2025) arts. 8–10, paras. 12–15.

¹³⁷ United Nations Commission on International Trade Law, *UNCITRAL Model Law on Automated Contracting with Guide to Enactment*, para. 61.

agreement under Article 7(1) can be identified. For example, if the developer or platform operator exercises dominant control, then based on these indicators, they should be held liable.

3.7. A Comparison of Liability Models Under the EU AI Act, the UNCITRAL MLAC, and *Wakalah Muqayyadah*

The EU AI Act, UNCITRAL MLAC, and *wakalah muqayyadah* (restricted agency) each affirm that autonomous AI systems are not legal subjects and possess no independent legal personality. The EU AI Act adopts a risk-based approach, classifying AI systems into four tiers and allocating liability linearly along the value chain. Each actor—whether provider, importer, distributor, or deployer—bears clearly defined compliance obligations corresponding to its role. Joint liability under the EU AI Act is triggered through Article 25, whereby a deployer, importer, or distributor is deemed a provider and assumes the full compliance burden if it: (1) places its own brand on an AI system already on the market; (2) makes substantial modifications to the architecture or functionality of a high-risk AI system; or (3) alters the intended purpose of an AI system from a non-high-risk to a high-risk category. This provision effectively prevents the evasion of liability through white-labeling or reckless modifications.

UNCITRAL MLAC offers a more flexible approach through its attribution mechanism. Article 7 establishes that the actions of an automated system are attributed in accordance with the procedure agreed upon by the parties or, in the absence of such agreement, to the person who uses the system for that purpose, taking into account factors such as who deployed the system, who controls the operational parameters, who derives the economic benefit, as well as the nature and purpose of the contract. The principle of party autonomy is upheld. However, MLAC also has a limitation: it governs only attribution, not the form or extent of liability, which is left entirely to national substantive law, thereby creating the potential for cross-border legal fragmentation.

As for *wakalah muqayyadah* (restricted agency) integrated with *kafalah* (suretyship/guarantee) and *takaful* (joint guarantee/mutual assurance), it positions AI as a *wakil muqayyad* (restricted agent), whose actions and liability are attributed to the *muwakkil* (principal) on the basis of the agreed-upon contract. In the case of errors involving multi-party contributions, for example, a developer's negligence in coding—the mechanism of tiered *kafalah* applies, whereby each party acts as a *kafil* (guarantor) bearing the loss proportionally based on its contribution and the benefit it receives, consistent with the rule of *al-ghurm bi al-ghurm* (liability accompanies gain).¹³⁸ Meanwhile, if the error results from complex systemic interactions and cannot be definitively attributed to any single party, the joint *takaful* fund, formed from the contributions of the parties, serves as a collective safety net, realizing the principle of *ta'awun* (mutual assistance) and ensuring access to justice. This hierarchical construction ensures that no loss remains uncompensated, thereby preserving the protection of property (*hifz al-mal*) as part of *maqashid al-syari'ah* (the higher objectives of Islamic law) within the increasingly decentralized smart contract ecosystem.

4. Conclusion

Based on the foregoing discussion that the legal status of autonomous AI under Islamic contract law cannot be equated with that of a human being as a legal subject (*mukallaf*). This conclusion is grounded in the argument that autonomous AI does not satisfy the most fundamental criteria of being *al-'aqil* (a rational subject) and lacks the moral capacities required by sharia, including the inability to respond responsibly when unexpected events occur. Consequently, autonomous AI does not possess full legal capacity (*ahliyyah al-ada'*) to act as a party to a contract. As a corollary, autonomous AI is positioned as a *wakil muqayyad* (restricted agent), acting on behalf of and for the benefit of the *muwakkil* (user/owner). A contract or *akad* executed by autonomous AI remains valid not because of the AI's own action, but because all the essential elements (*rukun*) and conditions of the contract have been satisfied by the human parties involved. The manifestation of consent (*ijab* and *qabul*) is deemed to have occurred when the parties consciously use and delegate contract execution through the smart contract system.

¹³⁸ Ghazali et al., "The Fiqh Maxim al-Ghunm bi al-Ghurm."

The consequence is that all liability for errors or losses caused by the AI rests entirely with the party behind it, whether an individual or a company, based on the principle of *al-kharaj bi al-daman* (liability accompanies entitlement). For complex multi-party scenarios, this study proposes the integration of tiered *kafalah* (suretyship/guarantee) as a mechanism for allocating individual responsibility, and *takaful* (joint guarantee/mutual assurance) as a collective safety net when individual attribution is not possible.

The distinctive of this study lies in its application of *wakalah muqayyadah* (restricted agency) as an operational legal framework for autonomous AI within Islamic smart contracts, derived through the methodology of *qiyas adna* (inferior analogy) from the classical institution of *'abd al-ma'dhun* (a slave permitted to engage in trade). This construction has not been explicitly proposed in existing literature, whether in contemporary fiqh discourse or in interdisciplinary studies on AI and Islamic law. Moreover, the integration of *kafalah* (suretyship/guarantee) and *takaful* (joint guarantee/mutual assurance) into the *wakalah muqayyadah* framework to address multi-party issues within the blockchain ecosystem constitutes an original contribution that distinguishes this study from previous research.

Nevertheless, this study has certain limitations that open avenues for further research. First, the validity of *qiyas adna* (inferior analogy) in constructing the *'abd al-ma'dhun* (a slave permitted to engage in trade) paradigm depends entirely on the arguments of *ushul al-fiqh* (principles of Islamic jurisprudence). Second, the *wakalah muqayyadah* (restricted agency) framework remains theoretical and normative, and has not yet been empirically tested on an actual Islamic smart contract platform. Third, the *takaful* (joint guarantee/mutual assurance) mechanism as a collective safety net requires technical and institutional design that has not been mapped out in this study, including the regulation of the common fund and its claims procedure. Accordingly, further research is needed in the areas of empirical testing of the *wakalah* framework on Islamic smart contracts, the development of a *takaful* model through multidisciplinary collaboration, and anticipatory fiqh studies concerning the possible shift in classification from *qiyas adna* to *qiyas musawi* (middle analogy) or *qiyas awlawi* (superior analogy) as AI advances toward human-like consciousness. Thus, this study represents an initial step in a discourse that will continue to evolve in tandem with technological progress in AI and the dynamics of contemporary Islamic legal thought.

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