

## Trade Contracts in the Hands of AI, Who is Responsible?

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### Abstract

*The increasing integration of artificial intelligence (AI) in the formation and execution of trade contracts has introduced profound legal complexities within Indonesia's civil law system. While the Indonesian Electronic Information and Transactions Law (ITE Law) and Government Regulation No. 71 of 2019 (PP PSTE) confer legal validity on electronic contracts and the use of electronic agents, they offer limited doctrinal guidance on liability attribution when AI operates autonomously. This normative legal study investigates how existing Indonesian legal instruments, particularly the Civil Code, can accommodate AI-mediated contractual performance and explores who should bear legal responsibility in cases of breach, error, or non-performance. Employing statutory, conceptual, case, and comparative approaches, the research constructs a proximate responsibility model grounded in civil liability theory, legal subject theory, and risk allocation principles. Findings indicate that Indonesia's anthropocentric notion of legal subjectivity limits current liability frameworks, creating ambiguity where AI operates independently. The study proposes doctrinal reforms, including statutory amendments, administrative oversight, sector-specific regulations, and a multi-stakeholder liability model. These recommendations aim to ensure legal certainty, contractual fairness, and consumer protection in an increasingly automated commercial environment. The study contributes original doctrinal insights by systematically linking Indonesian civil law to emerging international AI governance models and offering a structured pathway for legal reform responsive to technological disruption.*

**Keywords:** *Artificial Intelligence, Electronic Contracts, Legal Responsibility, Indonesian Civil Law, Legal Subject Theory.*

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## INTRODUCTION

The digitization of commerce has ushered in a new paradigm in contract formation and execution, marked by the integration of artificial intelligence (AI) into electronic contract lifecycle management. AI is now employed not only in contract drafting and negotiation but also in automated performance and enforcement, often with minimal or no human intervention. Global legal frameworks, such as the UNCITRAL Model Law on Electronic Commerce and the United States' ESIGN Act, have evolved to recognize and facilitate such developments, ensuring legal parity between electronic and traditional documents (Jiang et al., 2023; Panzbekova et al., 2022; Shcherbyna et al., 2021). In Indonesia, the enactment of Law No. 11 of 2008 on Electronic Information and Transactions (ITE Law) and its implementing regulation, PP No. 71/2019, provides foundational recognition for electronic contracts and signatures. Article 5(1) – (3) of the ITE Law confirms the legal force of electronic documents and information, setting the stage for AI to operate within commercial transactions (Presiden Republik Indonesia, 2008).

AI technologies offer considerable efficiency gains through smart contract platforms and AI-driven contract analytics, which apply machine learning and natural language processing (NLP) to interpret, negotiate, and enforce contractual terms (Cummins & Clack, 2022; Tauqeer et al., 2022). These tools have expanded into compliance monitoring and risk allocation, increasingly being embedded into electronic transaction systems. Research by Soekiman et al (2023), reviewing research on AI, explains that AI is more likely adopted rapidly by large, technologically advanced organizations raises concerns of oversights. This generalization might fail to capture the diversity among industries. However, their integration introduces new

layers of legal uncertainty. Indonesia's ITE Law recognizes electronic agents (Article 21) and electronic systems (Article 1(5)), but it does not explicitly allocate liability in cases where AI systems fail or make erroneous decisions with contractual consequences (Presiden Republik Indonesia, 2008). The resulting ambiguity in legal responsibility for automated contract performance has exposed a critical regulatory vacuum in Indonesian contract law.

Despite the growing prevalence of AI in commerce, Indonesian civil law remains rooted in a strict anthropocentric view of legal subjectivity and therefore does not accommodate AI as a bearer of rights or duties. Legal obligations and liabilities are traditionally assigned only to natural persons or juridical entities as recognized under Article 1320 of the Civil Code. The tension between technological advancement and doctrinal rigidity has produced an unsettled legal landscape in which accountability for AI-driven contracts remains ambiguous. In light of the operational role of AI in concluding and executing trade contracts, a comprehensive doctrinal inquiry is necessary to evaluate how Indonesia's existing legal instruments may adapt to this emerging paradigm.

Although electronic contracts are legally recognized under the ITE Law and have seen significant adoption in Indonesia, the deployment of autonomous AI in managing these contracts raises substantial legal questions. Specifically, when AI systems act as electronic agents under Pasal 21 of the ITE Law and autonomously execute contractual decisions, it remains unclear who holds liability in cases of breach, non-performance, or error. The statutory framework assumes human control and agency in electronic transactions, but does not define fault or accountability when those agents are algorithms or machine-learning systems rather than humans. This issue is further exacerbated by the non-deterministic behavior of AI and the opacity of its decision-making processes. These characteristics complicate fault-based liability attribution as required under Articles 1365 to 1367 of the Civil Code.

The general solution proposed in this research involves developing a normative legal framework grounded in Indonesian civil law principles, particularly the concepts of fault, risk and good faith, in order to determine how liability should be allocated among AI developers, users, and system operators. The framework will draw on legal subject theory as well as comparative insights from jurisdictions that are examining forms of limited legal personhood for AI systems. Through the reconciliation of doctrinal foundations and technological realities, this research aims to promote legal certainty and safeguard the interests of parties engaged in AI-based trade transactions.

The integration of AI into contract law has sparked international scholarly debate on the appropriate attribution of liability when AI systems act autonomously. While most jurisdictions still treat AI as a legal object, recent proposals have emerged advocating for the recognition of "electronic personhood" to address accountability gaps. The European Parliament's Committee on Legal Affairs, for instance, has suggested a model of limited legal personhood for autonomous AI to facilitate asset holding and liability assignment without unduly insulating developers or users from responsibility (Fauquet-Alekhine, 2023; Nhemi, 2023). These proposals mirror corporate personhood doctrines, where liability is structured through legal fictions to align governance with accountability (Verbruggen, 2022).

In contract execution, AI functions both as a decision-making tool and as an agent capable of initiating and modifying contractual obligations. The ITE Law recognizes such agents under the concept of "*Agen Elektronik*" (Pasal 1(8) and Pasal 21(2)–(4)), stipulating that the provider of the electronic agent bears responsibility for transactional outcomes, unless force majeure or user negligence can be proven. While this offers a starting point, it remains insufficient for delineating responsibility in cases where AI decisions are derived from probabilistic models or large-scale data inference rather than direct programming.

To bridge this doctrinal gap, this study draws on civil liability theory, particularly tortious and contractual liability under Indonesian law, in order to construct a layered responsibility

model. The model integrates the principles of good faith, fault liability, and risk allocation as reflected in Articles 1243 and 1365 to 1367 of the Civil Code, together with governance structures informed by debates on AI personhood and insurance theories. Contracts may incorporate specific risk-allocation clauses, such as service-level agreements (SLAs) and indemnities, but these must be contextualized within the broader legal framework to ensure enforceability and fairness in dispute resolution.

Existing literature on AI in legal contexts, especially within Indonesia, tends to focus predominantly on general e-commerce regulations and consumer protection, without addressing the unique legal status and agency of AI systems in contract formation and execution. Although the ITE Law provides a detailed architecture for electronic transactions and electronic signatures (Pasal 5–11), it does not explore the doctrinal implications of AI acting as a contract party or the need for liability reform. Moreover, prevailing interpretations of “legal subjects” remain limited to humans and corporations, leaving AI as an unregulated intermediary with significant operational autonomy.

The global adoption of electronic contracting has been significantly transformed by the integration of Artificial Intelligence (AI), which enables the creation and performance of contracts without human intervention. Electronic contracts, defined as legally binding agreements concluded through digital means, are increasingly administered by AI systems that utilize natural language processing (NLP), machine learning, and blockchain technologies (Panzbekova et al., 2022; Shcherbyna et al., 2021). These systems facilitate clause analysis and contract review, and they also support autonomous negotiation and smart contract execution (Cummins & Clack, 2022; Heidari et al., 2023).

In Indonesia, the legal framework governing electronic contracts is primarily articulated in Law No. 11 of 2008 on Electronic Information and Transactions (ITE Law). According to Articles 5 to 11, electronic documents and electronic signatures possess legal force equivalent to conventional paper-based instruments, provided that they meet specified reliability criteria. Article 21 introduces the concept of electronic agents and affirms that electronic systems, including AI, may be employed in forming contracts without direct human supervision. However, the ITE Law does not define liability in circumstances where such agents fail or make errors in contractual execution, thereby producing ambiguity in the allocation of civil responsibility.

Within Indonesia’s civil law tradition, liability for contractual and extra-contractual harm is grounded in fault-based principles codified in the Indonesian Civil Code (*KUHPerdata*). Article 1243 regulates liability for *wanprestasi* (breach of contract), while Articles 1365 to 1367 govern unlawful acts and assign liability in situations where damage arises from negligence or wrongful conduct (Kurniawan et al., 2022; Ramadianto, 2023). Risk allocation in contracts typically involves indemnity, force majeure, or limitation clauses; however, these mechanisms presuppose identifiable and competent parties rather than autonomous and non-human agents as contractual actors.

Recent literature emphasizes the inadequacy of traditional doctrines in governing AI-based contract performance. Scholars argue that fault determination becomes increasingly problematic when decisions stem from opaque AI algorithms, whose processes are often untraceable and non-deterministic (Tauqeer et al., 2022; Zhao et al., 2025). Moreover, current models do not account for scenarios where developers or system operators lose real-time control over AI behavior during contractual execution. These gaps necessitate a normative reconsideration of civil liability doctrines.

Indonesian contract law, as reflected in Article 1320 of the Civil Code, presupposes that only legal subjects, defined as either natural persons or juridical entities, may enter into enforceable agreements. AI systems, by contrast, are currently classified as legal objects without the capacity to hold rights or obligations (Luo & Funk, 2024). Consequently, they fall outside the domain of contractual responsibility unless their actions can be attributed to human agents.

However, a growing body of literature supports the recognition of limited legal personhood for AI, especially in contexts requiring autonomy and economic agency. The European Parliament, for instance, has proposed a model of electronic personhood for highly autonomous AI systems, aimed at facilitating accountability and compensatory mechanisms (Fauquet-Alekhine, 2023; Nhemi, 2023). Critics caution, however, that such frameworks risk diluting human accountability and enabling liability shielding, especially where developers or owners exploit AI's legal ambiguity (Constantinescu et al., 2021; Verbruggen, 2022). Within Indonesia, no formal proposal has yet addressed this issue doctrinally, underscoring the novelty and urgency of the current research.

The theory of civil liability provides the foundational lens through which contractual and extra-contractual obligations are assessed. In Indonesia, liability for breach of contract is governed by Article 1243 of the Civil Code, which allows the aggrieved party to seek damages, performance, or termination. Tortious liability, as established in Article 1365, arises from unlawful acts and requires proof of fault, harm, and causation. This study applies civil liability theory to analyze whether AI's autonomous actions can be normatively linked to human actors (e.g., developers or users) under fault-based frameworks, and how Indonesian courts might interpret such causality.

At the core of this research lies the legal subject theory, which interrogates whether AI systems can or should be recognized as entities bearing legal obligations. This theory examines the doctrinal construct of personhood in Indonesian law and compares it with emerging models such as partial legal status, rights-only standing, and electronic personhood (Chesterman, 2020; Verbruggen, 2022). It enables a conceptual inquiry into the ways legal systems adapt to the existence of non-human agents in contract execution and whether the role of AI should remain derivative of its human operators or be granted independent legal status.

The theory of risk allocation evaluates how responsibility is distributed in situations involving technological uncertainty or system malfunction. Contractual clauses such as indemnity, SLAs, or liquidated damages attempt to shift performance risk, but their effectiveness depends on clearly defined legal responsibilities. In the context of AI, where multiple parties may interact with or contribute to system behavior, traditional allocation mechanisms become insufficient. This theory supports the design of a multi-tiered liability model incorporating AI developers, users, platform providers, and data handlers (Glavaničová & Pascucci, 2022; Ng et al., 2023).

The principles of legal certainty and contractual fairness, which are enshrined in Article 1(3) of the 1945 Constitution and Article 1338(3) of the Civil Code, provide normative constraints on liability attribution. Legal certainty ensures the predictability and enforceability of obligations, while fairness requires an equitable distribution of burdens and benefits. These principles guide the development of normative recommendations for AI contracting so that any proposed liability framework remains consistent with Indonesia's constitutional and civil law commitments (Jasmaniar & Zainuddin, 2022; Sulaiman & Gunadi, 2024).

Comparative research highlights emerging models of liability distribution in jurisdictions such as the European Union and Singapore, where regulatory sandboxes, AI ethics guidelines, and risk-based legal innovations are being tested (Negri, 2021; Zhao et al., 2025). These models show that fault-based regimes alone may be insufficient in addressing the decentralized and often opaque operations of AI systems. Moreover, cross-border transactions complicate jurisdictional accountability, as AI systems frequently operate across multiple legal domains. This circumstance raises questions regarding the choice of law and the enforcement of judgments in the context of international trade. Within the Indonesian academic landscape, a clear research gap exists: no prior doctrinal study has systematically evaluated legal responsibility in AI-driven contract execution from the perspective of Indonesian civil law. Most studies emphasize data protection or digital infrastructure, with minimal engagement in civil liability theory or legal

subject theory as applied to AI. This research thus fills a critical void by articulating how traditional liability doctrines can adapt to emerging technological agents, and by proposing a systematic normative framework tailored to Indonesia's legal context.

This research is novel in its approach to AI not merely as a technical tool, but as a semi-autonomous agent with de facto influence over contractual relations. It uniquely combines doctrinal legal analysis with normative reconstruction, offering a hybrid liability model that is both consistent with Indonesian legal traditions and responsive to technological disruption. The scope of the study is confined to the Indonesian civil law system, focusing exclusively on contractual and tortious liability in the context of AI-driven trade contracts. It excludes criminal law and sector-specific domains such as healthcare and defense. The study's output includes normative legal recommendations and model clauses to inform future legislative reform and regulatory guidance.

## RESEARCH METHODS

The methodology of this research adopts a doctrinal or normative legal approach by utilizing primary legal sources such as the Indonesian Civil Code (KUHPperdata), Law No. 11 of 2008 on Electronic Information and Transactions (ITE Law), Government Regulation No. 71 of 2019 (PP PSTE), and other sectoral regulations issued by Bank Indonesia and the Financial Services Authority (Majeed et al., 2012). These sources are supported by secondary materials including legal textbooks, academic journals, and policy papers, as well as tertiary materials such as legal dictionaries and international instruments, for example those issued by UNCITRAL and UNIDROIT. The study employs four legal approaches, namely statutory, conceptual, case, and comparative approaches, in order to systematically analyze how Indonesian law addresses, or fails to address, legal responsibility in AI-operated trade contracts. Structured as a normative inquiry rather than empirical research, the design focuses on interpreting positive legal norms, examining legal subjectivity and liability allocation, and proposing a responsibility model through normative reasoning. Data are collected exclusively through legal document analysis obtained from government platforms, legal databases, and academic repositories, and are examined using deductive reasoning, systematic interpretation, and normative legal argumentation grounded in grammatical, systematic, and teleological methods (Majeed et al., 2012). The objective is to maintain coherence with the principles of legal certainty, fairness, and justice, while drawing on comparative insights from jurisdictions such as the European Union, the United States, and Singapore to inform potential reforms within the Indonesian legal system.

## RESULT AND DISCUSSION

### *Legal Recognition of Electronic Contracts in Indonesia*

The ITE Law (Law No. 11 of 2008) establishes the legal validity of electronic information, documents, and signatures, equating them with conventional, paper-based contracts, as long as reliability criteria are fulfilled (ITE Law, Art. 5(1); Art. 11).

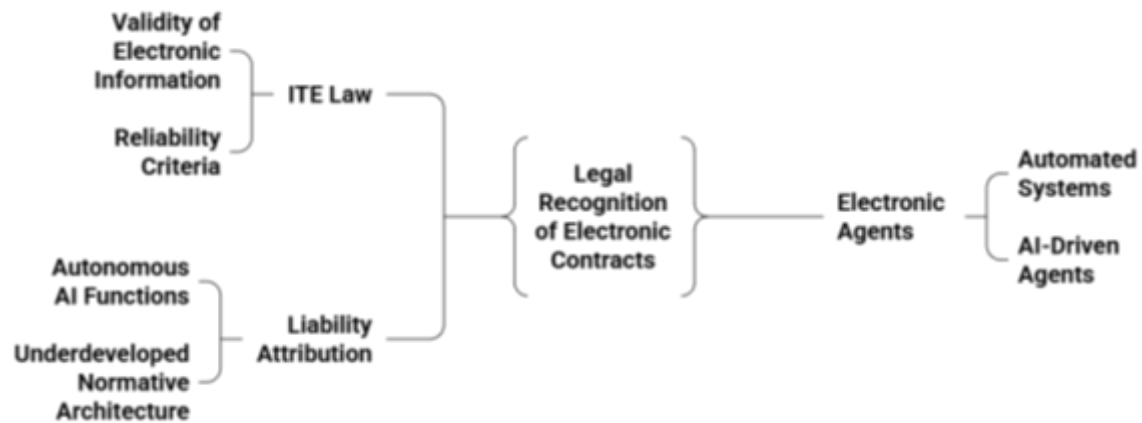


Figure 1. Legal Recognition of Electronic Contracts in Indonesia

Under this framework, electronic contracts formed through data messages, including those executed via automated systems or AI-driven agents, are considered legally binding if the parties' consent can be clearly demonstrated. Article 21 introduces the concept of electronic agents, authorizing their use in forming agreements without direct human oversight. However, while this provision validates AI-mediated contract formation, it remains silent on liability attribution, particularly when AI functions autonomously beyond the users' direct control. Thus, while contract validity is generally accommodated under the current legal framework, the normative architecture for civil responsibility in such AI-mediated contexts remains underdeveloped.

Indonesia's ITE Law treats electronic information, documents, and printouts as valid legal evidence for AI assisted trade contracting, validates electronic signatures under Article 11, and permits agreements through electronic agents under Article 21, but it still leaves liability attribution unclear when AI acts beyond the user's intended scope. In practice, AI can form cross border sale contracts through EDI quoting and auto acceptance, where logs and EDI receipts evidence consent, while authority limits, audit trail clauses, and voidability windows reduce disputes and allocate responsibility for autonomous errors.

AI can also book export freight through carrier portals, with enforceability supported by compliant electronic systems and Article 11 e signatures, while escalation rules and human override terms control high risk decisions. For commodity trading, parties can sign a master agreement with e signatures and let AI automate call offs and invoicing, relying on Art. 5(1) evidence artifacts and clear precedence rules to prevent AI generated deviations from overriding signed terms. Operationally, contracts should include authority, evidence, signature, and error liability clauses to define the electronic agent's scope, preserve proof of assent, and assign losses from AI malfunction or misconfiguration with a manual confirmation mechanism.

#### ***Attribution of Liability in AI-Operated Contracts under Indonesian Civil Law***

Under the Civil Code, liability in contract law (Article 1243) and tort law (Articles 1365–1367) is traditionally based on the fault-based paradigm—requiring a demonstrable act of negligence or intentional wrongdoing. However, when AI systems autonomously make decisions leading to a breach or harm, tracing fault to a specific human actor becomes complex, especially where multiple entities are involved (developers, operators, users, and vendors). Although Article 1367 permits vicarious liability for the acts of dependents or subordinates, the concept does not directly apply to AI as it is not recognized as a legal subject, nor a legal dependent in the traditional sense. Consequently, the assignment of legal responsibility remains ambiguous, particularly where AI systems operate within self-learning or adaptive environments, raising questions on foreseeability, causation, and control.

#### ***Legal Subjectivity and the Status of AI in Indonesian Law***

The Indonesian legal system adheres strictly to an anthropocentric model of legal subjectivity, whereby only natural persons and legal entities possess rights and duties. Accordingly, AI is categorized as a legal object, akin to software or tools, and cannot independently hold liability (Civil Code, Art. 1320). While the ITE Law allows for autonomous electronic agents to participate in contractual processes, it does not extend legal subject status to AI nor specify who absorbs liability when these agents malfunction or breach contractual obligations. As such, legal personhood for AI remains unrecognized, leaving a normative void in the treatment of autonomous systems. Comparative jurisdictions, such as the European Union, have proposed frameworks for limited electronic personhood (Nhemi, 2023), suggesting possible models that Indonesia may evaluate in future regulatory reforms.

### ***Risk Allocation and Responsibility Structures in Contractual Practices***

In current practice, parties using AI in trade contracts attempt to manage uncertainty through risk-allocation mechanisms, such as indemnity clauses, liability caps, and force majeure provisions. However, these clauses are effective only where there is a clearly identifiable liable party a requirement complicated by the opacity and autonomous behavior of AI systems. While risk allocation theory encourages pre-contractual clarity on performance responsibilities, such arrangements may not be legally enforceable when the AI's decision cannot be traced to any party's intent or negligence (Ng et al., 2023). Moreover, developers and system operators may attempt to disclaim liability via contractual clauses, leading to potential gaps in consumer protection and commercial fairness, especially if end-users lack bargaining power.

### ***Comparative Legal Insights and Best Practices***

International jurisdictions are evolving to address AI responsibility gaps through both soft law and regulatory reforms. The European Union, for example, has introduced proposals for an AI Liability Directive and AI Act, which suggest mandatory transparency, risk assessment, and accountability frameworks for high-risk AI systems. In the United States, tort law principles are being tested in courts to determine whether AI outcomes can be attributed to human actors via negligence or product liability doctrines. Singapore, through its Model AI Governance Framework, advocates for ethical and explainable AI, backed by insurance schemes and layered responsibility models. These systems demonstrate a proactive orientation toward regulatory flexibility, while maintaining core principles of legal accountability. Indonesia's legal system may benefit from adopting similar multi-actor liability frameworks and insurance-backed models tailored to its civil law traditions and regulatory capacity.

### ***Doctrinal Gaps and Need for Normative Reconstruction***

Despite recognizing the role of AI in electronic contracts, Indonesia's legal regime lacks a comprehensive doctrinal model for attributing legal responsibility when AI systems autonomously execute or breach contractual obligations. Current norms fail to address scenarios where AI actions diverge from human intentions or exceed pre-programmed instructions. This absence creates legal uncertainty, undermining the principles of legal certainty and contractual fairness (Constitution, Art. 1(3); Civil Code, Art. 1338(3)). The study finds that a normative reconstruction is necessary one that harmonizes traditional civil liability principles with the realities of AI deployment. Such a reconstruction should include recognition of proximate responsibility, risk allocation frameworks across the AI ecosystem, and potentially, a reconsideration of the legal status of autonomous systems. These measures are essential to uphold fairness, protect contracting parties, and foster responsible AI adoption.

### ***Normative Reconstruction of Legal Responsibility for AI in Contracts***

Given the inability of existing Indonesian civil law to address liability in AI-operated contracts effectively, this study proposes a normative reconstruction grounded in civil liability theory, legal subject theory, and risk allocation doctrine. Instead of granting full legal personhood to AI which carries significant conceptual and regulatory burdens the reconstruction advocates a proximate responsibility model, where liability is assigned to the closest accountable human or

legal actor in the AI lifecycle (e.g., developers, platform operators, or users). This aligns with the principle of good faith and fault-based liability (Civil Code Articles 1243, 1365–1367) and ensures that human oversight remains central to legal accountability. To support this, regulatory recognition of AI as a quasi-agent with attributable consequences without conferring full legal personhood can bridge the gap between technological autonomy and anthropocentric legal structures (Verbruggen, 2022; Fauquet-Alekhine, 2023). This approach is compatible with existing Indonesian doctrine and international comparative models, and mitigates the risk of liability diffusion or regulatory arbitrage.

### ***Legal-Policy Recommendations for Regulatory Reform***

To enhance legal certainty and fairness in AI-driven contractual relations, this study offers four core policy recommendations:

1. Amendment of the ITE Law and PP PSTE to define the roles and responsibilities of AI agents in digital transactions, particularly regarding liability allocation, auditability, and transparency of algorithmic decision-making (Mentari et al., 2023; Wardana et al., 2023).
2. Introduction of a supervisory framework for AI-based electronic systems, possibly through Kominfo, which would register high-risk AI platforms, monitor compliance with ethical and legal standards, and require transparency protocols for automated decisions.
3. Development of sector-specific guidelines under BI and OJK to regulate AI applications in financial services, smart contracts, and consumer protection, ensuring robust liability insurance mechanisms and dispute resolution avenues.
4. Incorporation of a multi-stakeholder liability model that allows joint and several liability among AI developers, service providers, and end-users, inspired by the EU's evolving framework and Singapore's AI governance strategy (Nhemi, 2023; Glavaničová & Pascucci, 2022).

These recommendations aim to align Indonesia's legal infrastructure with the realities of automated commerce while maintaining doctrinal coherence and regulatory feasibility.

### ***Strategic Implications for Legal Reform and Future Research***

This study's findings underscore the urgent need for reform of Indonesia's digital contract law, especially concerning legal accountability in AI-mediated transactions. As AI continues to transform trade and e-commerce, the absence of a clear liability regime may erode public trust, hinder innovation, and compromise consumer protection. Reform should not only focus on amending statutes but also on capacity building, judicial training, and the harmonization of sectoral regulations to create an integrated, forward-looking legal ecosystem. Furthermore, the proposal to consider limited quasi-legal status for AI systems within a tightly controlled framework should be explored through broader academic debate and policy consultation. Future research could examine case law developments, comparative liability allocation models, and AI governance experiments in other jurisdictions to deepen the normative foundations of Indonesian digital law. Ultimately, legal doctrine must evolve in tandem with technological transformation to uphold legal certainty, justice, and economic resilience.

## **CONCLUSION**

The integration of artificial intelligence into commercial contracting environments has created significant legal challenges for Indonesia's civil law framework. While electronic transactions and digital contracting are already accommodated under the ITE Law and PP PSTE, the rise of autonomous or semi-autonomous AI systems disrupts foundational assumptions concerning legal subjectivity, fault, and liability. Existing Indonesian contract and tort rules grounded in anthropocentric principles of legal capacity, good faith, fault-based responsibility,

and risk allocation do not yet provide explicit guidance for situations where AI systems independently execute, fail to perform, or breach contractual obligations.

Through doctrinal analysis, this study finds that Indonesia's civil law can partially address AI-mediated transactions using existing principles of contractual and extra-contractual liability, but significant regulatory ambiguity persists regarding the proper allocation of responsibility among developers, platform providers, and users. Comparative insights from the EU, U.S., and Singapore reveal emerging governance models that emphasize transparency, auditability, insurance-based compensation, and sector-specific oversight for high-risk AI applications.

To address these gaps, a normative reconstruction is proposed in the form of a proximate responsibility model, which preserves human accountability while recognizing AI as a quasi-agent capable of generating legally relevant consequences without requiring full legal personhood. This approach maintains doctrinal coherence with Indonesian civil liability theory while offering practical pathways for law reform. Ultimately, ensuring legal certainty, fairness, and consumer protection in AI-based commerce will require coordinated statutory amendment, administrative oversight, and doctrinal development to enable Indonesia's legal system to evolve alongside technological innovation.

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