

Legal Liability of AI-Based Digital Agreements in Indonesian Contract Law

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ABSTRACT

The increasing use of Artificial Intelligence (AI) in digital transactions has transformed the mechanism of contract formation within contemporary commercial activities. AI systems are currently capable of drafting contractual clauses, processing transactional data, and generating automated agreements with minimal human intervention. Such developments raise legal issues concerning contractual validity, legal consent, and the allocation of liability when losses arise from AI-assisted contractual processes. This study examines the construction of legal liability in AI-based digital agreements within the Indonesian legal system. The research employed a normative juridical method using statutory, conceptual, comparative, and analytical approaches. The findings indicate that AI-based digital agreements remain subject to the fundamental principles of Indonesian contract law, particularly the validity requirements stipulated under Article 1320 of the Civil Code, the principle of freedom of contract, and good faith. Indonesian law nevertheless does not recognize Artificial Intelligence as an independent legal subject capable of bearing direct legal responsibility. Liability therefore remains attached to parties exercising control, supervision, operation, or economic benefit from the use of AI systems, including business actors, developers, and electronic system providers. The study further identifies a normative gap within Indonesian positive law concerning AI governance, transparency obligations, and allocation of liability in automated contractual relations. This condition potentially creates legal uncertainty and weakens legal protection for parties involved in AI-assisted transactions. The study offers an integrated liability framework capable of addressing legal uncertainty arising from AI-assisted contractual systems within Indonesian contract law.

Keywords: Artificial Intelligence; Contract Law; Digital Agreements; Legal Certainty; Legal Liability

INTRODUCTION

The rapid expansion of information and communication technology has transformed the patterns of legal relations in contemporary society. Economic transactions, commercial activities, and public services increasingly rely on electronic systems that prioritize efficiency, accessibility, and speed of service. One significant consequence of this transformation is the growing use of digital agreements as legal instruments governing relationships between parties in electronic transactions. Digital contracts are no longer positioned merely as complementary instruments; they have evolved into a primary mechanism within modern commercial practices and digital ecosystems.

Recent legal developments in digital governance indicate that Artificial Intelligence (AI) has strengthened the digitalization of contractual relations (Khan et al., 2023; Zeberga et al., 2024). AI systems are now capable of performing functions that were previously carried out exclusively by humans, including drafting contractual clauses, analyzing legal risks, processing large-scale data, and adjusting contractual content according to users' preferences and behavioral patterns. The increasing integration of AI into contractual activities demonstrates that technology has begun to influence not only technical procedures but also the substance and formation of legal relations themselves (Alhalalmeh & Al-Tarawneh, 2025; Ismayilzada, 2024; Martinelli, 2023).

Legal issues arise when AI systems are involved in the process of forming digital agreements with a high degree of autonomy. Indonesian contract law fundamentally places humans and legal entities as legal subjects capable of exercising rights and obligations. Article 1320 of the Indonesian Civil Code requires consent, legal capacity, a certain object, and a lawful cause as essential elements of a valid agreement. Therefore, the validity of an agreement rests on the existence of conscious intent and mutual consent between legal subjects (Klabbers, 2023; Munir, 2023). However, AI systems do not possess legal consciousness, free will, or moral judgment, as recognized in conventional legal doctrine.

Complexity arises when AI-generated agreements produce losses, misleading clauses, or contractual defects that affect one of the parties. The legal relationship between human conduct and autonomous AI output is often difficult to determine, particularly where human supervision is minimal. Questions concerning liability consequently become increasingly significant, especially in determining whether responsibility should be imposed on users, developers, business actors, or electronic system providers operating AI technology.

Several studies have discussed the legality of electronic contracts and consumer protection in digital transactions. Siregar (2025) focused on the evidentiary validity of electronic contracts in judicial proceedings, while (Koos, 2021) examined the civil law implications arising from the use of AI in commercial agreements. Other studies have analyzed liability in e-commerce transactions and marketplace systems (Amaliya et al., 2025; Duivenvoorde, 2022; Fairgrieve et al., 2024). Simamora et al. (2025) further emphasized that electronic agreements remain legally valid as long as they satisfy the essential contractual requirements under Indonesian civil law. Nevertheless, existing studies remain primarily focused on electronic transactions, consumer protection, and platform accountability within conventional digital environments. Limited attention has been directed toward the construction of legal liability arising specifically from AI-assisted contractual mechanisms, particularly regarding the interaction between algorithmic autonomy, contractual consent, and the principles of Indonesian contract law.

Previous studies have not comprehensively addressed how legal liability should be allocated when contractual decisions are generated using autonomous AI systems operating with minimal human intervention.

Current legal developments demonstrate that Indonesian positive law has not yet established comprehensive regulations specifically governing the use of Artificial Intelligence in contractual relations. Law Number 11 of 2008 concerning Electronic Information and Transactions, as amended by Law Number 19 of 2016, recognizes the legality of electronic contracts and systems. Nevertheless, existing regulations remain administrative and procedural in nature, without specifically regulating AI autonomy, explainability, transparency obligations, or the allocation of legal liability arising from AI-generated contractual activities. This creates a normative gap capable of generating legal uncertainty and weakening legal protection for parties involved in AI-based digital agreements.

Comparative legal developments indicate that several jurisdictions have begun to formulate adaptive regulatory frameworks for AI governance. The European Union Artificial Intelligence Act adopts a risk-based regulatory model that emphasizes accountability, transparency, human oversight, and protection against technological harm (European Commission, 2021). Singapore has similarly introduced governance principles concerning explainability and accountability in automated decision-making systems. These developments illustrate a global tendency toward legal reform aimed at balancing technological innovation with legal certainty and the protection of rights.

Normatively, the Indonesian legal system adopts an anthropocentric approach that places human intention as the core element of contractual validity and legal responsibility. This approach increasingly encounters difficulties when contractual mechanisms are shaped by predictive algorithms and autonomous technological systems. Rapid technological development consequently requires adaptive legal responses capable of addressing accountability issues arising from AI-assisted contractual relationships.

This study aims to analyze the legal liability of the parties involved in AI-based digital agreements within the Indonesian legal system. Particular attention is directed toward examining the compatibility of AI-assisted contractual mechanisms with the validity requirements under Article 1320 of the Civil Code, as well as identifying an appropriate framework for allocating legal responsibility in the event of losses arising from automated contractual processes. This study contributes to the development of Indonesian contract law by proposing a legal accountability framework that integrates the principles of contract law, civil liability, electronic system accountability, and technological governance within AI-assisted contractual relations.

The results of this study are expected to contribute to the theoretical development of Indonesian contract law amidst the rapid growth of autonomous technologies. Practical contributions are also anticipated in providing conceptual guidance for policymakers, business actors, and electronic system providers in establishing legal standards capable of ensuring accountability, legal certainty, and balanced legal protection in AI-based digital contractual relationships.

METHOD

This study employed a normative juridical method to examine legal issues arising from the use of Artificial Intelligence (AI) in digital agreements within the Indonesian legal system (Chambers, 2026; Negara, 2023). The normative approach was selected because the primary focus of the research concerns the interpretation of legal norms, legal principles, and doctrinal constructions related to contractual validity and legal liability in AI-assisted agreements. Analysis was therefore directed toward examining the adequacy of existing legal frameworks in responding to technological developments in digital contractual relations.

This research applied several legal approaches to strengthen the analytical framework. The statutory approach was conducted through the examination of legal instruments governing agreements, electronic transactions, and digital systems, particularly the Indonesian Civil Code, Law Number 11 of 2008 concerning Electronic Information and Transactions as amended by Law Number 19 of 2016, and Government Regulation Number 71 of 2019 concerning the Implementation of Electronic Systems and Transactions. The conceptual approach was used to analyze legal doctrines and principles relating to contractual consent, freedom of contract, good faith, legal certainty, and civil liability. A comparative approach was additionally employed by examining several international regulatory frameworks concerning Artificial Intelligence governance, particularly the European Union Artificial Intelligence Act and selected AI governance principles developed in Singapore. This comparative analysis was intended to identify regulatory tendencies and accountability models relevant to the Indonesian legal context.

The legal materials used in this study consisted of primary, secondary, and tertiary legal materials. The primary legal materials included statutory regulations and legal instruments directly related to agreements, electronic transactions, and the operation of electronic systems. Secondary legal materials were obtained from scientific journal articles, legal textbooks, research findings, and expert opinions discussing contract law, legal liability, electronic agreements, and Artificial Intelligence within civil legal relations. Tertiary legal materials, including legal dictionaries and supporting references, were used to clarify legal terminology and conceptual understanding relevant to the research topic.

Legal materials were collected through literature studies and document analyses. The collected materials were subsequently qualitatively analyzed using prescriptive legal analysis. The analysis focused on identifying normative gaps and evaluating the compatibility between conventional contract law principles and autonomous technological systems in digital contractual practices. The analysis also focused on evaluating the compatibility between conventional contract law principles and the increasing use of autonomous technological systems in digital contractual practices.

RESULT & DISCUSSION

AI-based digital agreements have significant legal implications in Indonesian contract law, particularly regarding contractual validity, liability allocation, and legal certainty in automated contractual relations. The examination of Indonesian positive law demonstrates that agreements generated through AI-assisted systems remain subject to Article 1320 of the Civil Code concerning the validity requirements of agreements.

The findings of this study indicate that AI-based digital agreements remain legally subject to the Indonesian contract law regime, particularly the provisions governing contractual validity under Article 1320 of the Civil Code (CC). Legal requirements concerning consent, legal capacity, a certain object, and lawful cause continue to constitute the primary legal foundation for determining the validity of agreements, regardless of whether contractual clauses are drafted manually or generated through automated systems. Therefore, AI involvement in contractual processes does not eliminate the necessity of fulfilling the substantive elements required by Indonesian civil law.

Table 1. Legal Implications of AI-Based Digital Agreements in Indonesia

Legal Aspect	Research Findings	Legal Implications
Validity of Agreement	AI-based agreements remain subject to Article 1320 Civil Code	Human consent remains the primary legal basis
Legal Status of AI	AI is not recognized as a legal subject	AI cannot independently bear legal liability
Contractual Liability	Liability remains attached to users, developers, or providers	Human control determines accountability
Regulatory Framework	Indonesian law has no specific AI contract regulation	Legal uncertainty and normative gaps persist
Legal Protection	Existing regulations remain fragmented	Potential imbalance of rights and obligations

The continuing application of conventional contract law principles demonstrates that Indonesian law still positions humans and legal entities as the central subjects of contractual relations. AI systems function through predictive computational models and machine learning mechanisms designed to process contractual data and generate automated outputs based on predefined programming structures. Russell (2010) explained that AI systems function through computational prediction and automated reasoning rather than independent legal consciousness. Similar observations were made by Ashley (2017), who emphasized that AI within legal activities should be understood as a technological support mechanism rather than an autonomous legal actor possessing rights and obligations.

Nevertheless, the contractual validity of AI-generated agreements raises important legal concerns regarding the concept of consent. The classical contract law doctrine assumes that agreements are formed through conscious intent and mutual understanding between legal subjects. AI-assisted contractual systems increasingly generate clauses automatically based on behavioral analysis, transaction histories, predictive algorithms, and user preferences. Such automation creates the possibility that contractual parties may formally agree to terms that they do not fully understand or negotiate directly.

Legal complexity becomes increasingly apparent when AI systems operate with a high degree of autonomy and minimal human supervision. Automated systems may produce contractual clauses containing hidden risks, unfair terms, or algorithmic bias that disadvantage one party. Machine learning systems frequently generate outcomes that are difficult to predict, even by the developers themselves (Bell, 2020; Lorenzoni et al., 2021). This condition creates what is commonly referred to as the “black box problem,” wherein users are unable to fully understand how automated contractual decisions are produced.

Therefore, the issue of consent in AI-generated agreements extends beyond procedural legality and enters the realm of substantive fairness. Indonesian contract law recognizes the principle of freedom of contract under Article 1338 of the Civil Code; however, contractual freedom presupposes equal understanding and voluntary intention between the parties. AI-generated agreements potentially weaken

this assumption because technological asymmetry often places consumers or users in weaker bargaining positions than business actors controlling digital systems.

Several studies have discussed the legality of electronic contracts and digital transactions in Indonesia. Siregar (2025) examined the evidentiary validity of electronic agreements in judicial proceedings, while Misbah and Imtiyaz (2024) analyzed the civil law implications of AI utilization in commercial contracts. Nevertheless, Nexisting studies remain largely focused on electronic transactions and have not comprehensively addressed the allocation of legal liability arising from autonomous AI-generated contractual processes. Therefore, the present study identifies a normative gap concerning accountability mechanisms within AI-assisted contractual relations.

Similar findings were identified in previous research on electronic contracts in Indonesia, which concluded that electronic agreements remain legally binding as long as they fulfill the essential contractual requirements stipulated under Indonesian civil law, including consent, legal capacity, lawful object, and lawful cause (Simamora et al., 2025)

Another significant finding concerns's the legal position within Indonesian civil law. The results of this study demonstrate that AI cannot be categorized as an independent legal subject capable of bearing direct legal responsibility. Indonesian positive law recognizes legal subjects as natural persons and legal entities established under statutory regulations. AI systems remain technological instruments that lack legal awareness, moral judgment, and autonomous legal intent.

The imbalance of information and technological understanding between platform providers and users potentially weakens consumer protection in digital contractual relations. Studies on digital legal literacy among Micro and Small Enterprises (MSEs) demonstrate that a limited understanding of privacy policies, terms and conditions, and digital legal obligations often places users in vulnerable positions within platform-based transactions (Flora et al., 2025).

The absence of legal personality for AI has important implications for determining liability in such agreements. Losses arising from AI-generated contractual decisions cannot be legally imposed on the technology itself. Responsibility remains attached to parties possessing effective control over the operation, supervision, development, or economic utilization of the AI system.

Table 2. Distribution of Legal Liability in AI-Based Contractual Relationships

Party	Legal Position	Potential Form of Liability
Business Actors	Users of AI contractual systems	Contractual and consumer liability
AI Developers	Designers of algorithms and automated systems	Product and system liability
Platform Providers	Operators of digital transaction systems	Administrative and civil liability
Consumers or Users	Parties utilizing automated agreements	Liability arising from misuse or negligence

The allocation of legal responsibility identified in this study reflects modern developments in civil liability doctrine, emphasizing accountability based on control, supervision, and economic benefit. Jadwani and Yadav (2025) argued that contemporary contract law increasingly requires legal protection mechanisms capable of balancing the interests of parties where disparities in information and bargaining power exist. AI-based contractual systems potentially intensify such disparities because users frequently lack access to the technological logic underlying these automated contractual mechanisms.

Legal uncertainty is increasingly problematic because Indonesian positive law has not yet established comprehensive regulations specifically governing AI utilization in contractual relations. Law Number 11 of 2008 concerning Electronic Information and Transactions, as amended by Law Number 19 of 2016, recognizes the legality of electronic contracts and systems. Nevertheless, existing regulations remain general and administrative in nature. Specific provisions governing AI autonomy, transparency obligations, algorithmic accountability, and the allocation of legal liability have not yet been comprehensively formulated.

The absence of specific legal standards creates a normative vacuum that can generate uncertainty in contractual disputes involving AI systems. Injured parties may encounter difficulties in proving the causation between algorithmic decisions and resulting losses. Business actors simultaneously face uncertainty regarding the extent of liability arising from AI systems developed or operated by third parties. This condition potentially creates inconsistent legal interpretations and weakens legal certainty within digital contractual practices.

Comparative legal developments indicate that several jurisdictions have begun adopting more adaptive regulatory approaches to AI governance. The European Union Artificial Intelligence Act applies a risk-based regulatory model that requires transparency, accountability, human oversight, and compliance obligations for high-risk AI systems (Ebers, 2023). Singapore has similarly introduced governance principles that emphasize explainability, fairness, and accountability in automated decision-making systems. These developments demonstrate a global shift toward legal frameworks capable of balancing technological innovation and legal protection.

Research conducted by Akpobome (2024) emphasized that rapid technological developments frequently exceed the capacity of legal systems to formulate responsive regulations. Land & Aronson (2020) similarly observed that digital technologies challenge conventional legal concepts concerning causation, human agency, and accountability. Indonesian contract law currently faces comparable difficulties because existing legal doctrines were originally constructed within conventional transactional environments that assumed direct human interaction.

Research on electronic contracts in Indonesia has also highlighted the continuing ambiguity surrounding authentication mechanisms, technological accountability, and the enforceability of digital agreements involving advanced technologies such as smart contracts and automated systems (Simamora et al., 2025)

The findings of this study further demonstrate that liability in AI-based digital agreements cannot rely exclusively on conventional fault-based principles. Autonomous AI systems can generate harmful contractual outcomes, even in the absence of intentional misconduct by users or developers. Consequently, several liability approaches become relevant, including fault, strict, product, and contractual liability.

Table 3. Proposed Legal Liability Framework for AI-Based Agreements

Legal Principle	Scope of Application	Responsible Parties
Fault Liability	Negligence in supervision or system operation	Users, business actors
Strict Liability	High-risk automated contractual systems	Platform providers, operators
Product Liability	Defective algorithms or technological failures	Developers and software providers
Contractual Liability	Breach of contractual obligations	Contracting parties

The liability framework proposed in this study reflects the multidimensional nature of AI-assisted contractual relations. Business actors utilizing AI for commercial purposes may bear contractual and consumer liability where automated systems create unfair contractual conditions. Developers may bear product liability where algorithmic defects directly contribute to losses suffered by contractual parties. Platform providers operating electronic systems may also bear administrative or civil liability if failures in digital infrastructure contribute to contractual harm.

The increasing use of algorithmic systems within digital platforms also reflects broader transformations in platform-based economic relations, where technological systems increasingly influence contractual relations, work allocation, and legal accountability structures (Gaol et al., 2026)

The overall findings confirm that AI technology has begun reshaping the structure of contractual relations within a digital society. Nevertheless, Indonesian contract law continues to rely on classical legal doctrines centered on human intent and conventional contractual interactions. Existing regulations have not yet fully accommodated the complexities of autonomous technological systems operating within digital transactions. Therefore, legal reform is increasingly necessary to establish clearer standards concerning transparency, accountability, human oversight, and allocation of liability in AI-based digital agreements. Such regulatory development is essential to ensure that technological innovation progresses consistently with the principles of legal certainty, fairness, and balanced legal protection in the Indonesian legal system.

CONCLUSION

The findings of this study demonstrate that AI-based digital agreements remain legally subject to the fundamental principles of Indonesian contract law, particularly the validity requirements stipulated in Article 1320 of the Civil Code (CC). The involvement of Artificial Intelligence in drafting, analyzing, or processing contractual clauses does not alter the legal nature of agreements as consensual legal relationships established between legally recognized subjects. Therefore, human intent, legal capacity, lawful cause, and agreement between parties continue to constitute the primary legal basis for determining contractual validity within digital transactions.

The study further confirms that Artificial Intelligence cannot be positioned as an independent legal subject bearing direct legal responsibility under Indonesian law. AI systems operate as technological instruments that function through algorithms, machine learning processes, and data-based automation designed and controlled by humans or legal entities. Consequently, legal liability arising from AI-generated contractual activities remains attached to parties exercising effective control, supervision, operation, or economic benefit from the use of the technology, including business actors, developers, electronic system providers, and users, depending on the degree of involvement and causal relationship to the resulting losses.

The absence of comprehensive regulations specifically governing AI utilization in contractual relations creates a normative vacuum in the Indonesian legal system. Existing legal instruments primarily regulate electronic transactions in general terms without providing clear standards concerning AI autonomy, transparency obligations, liability allocation, and legal protection mechanisms in automated contractual systems. This condition potentially generates legal uncertainty, particularly in disputes involving algorithmic errors, automated decision-making failures, and contractual losses resulting from AI-assisted processes.

Indonesian contract law remains heavily dependent on anthropocentric legal assumptions that place human intent at the core of contractual validity and accountability. Such a framework becomes increasingly inadequate in digital contractual environments shaped by autonomous algorithms, predictive systems and automated decision-making processes. The absence of adaptive legal standards potentially creates accountability fragmentation and weakens legal certainty in technology-driven contractual relationships.

This study proposes that the construction of legal liability in AI-based digital agreements should be developed through an integrated approach that combines the principles of contract law, civil liability, product liability, and electronic system accountability. Therefore, regulatory reform is necessary to formulate adaptive legal standards capable of balancing technological innovation with legal certainty, fairness, transparency, and protection of parties within digital contractual relations. Establishing clearer legal frameworks concerning human oversight, accountability mechanisms, and allocation of responsibility will become increasingly important as the use of Artificial Intelligence continues to expand within commercial and legal practices in Indonesia.

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