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## Reconstruction of the Concept of Legal Liability for Losses Caused by Autonomous Artificial Intelligence Systems

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### ABSTRACT

The rapid development of autonomous artificial intelligence (AI) systems through machine learning and self-learning algorithms has challenged the traditional fault-based civil liability framework in Indonesia. Classical liability constructs assume that harm can be traced to human intent or negligence, yet autonomous AI can generate unpredictable outcomes without direct human control. This normative juridical study aims to analyze the inadequacy of Indonesian legal norms in attributing responsibility for damages caused by autonomous AI systems and to formulate a more adaptive liability reconstruction model. The research applied a statutory and conceptual approach, examining Articles 1365–1367 of the Civil Code, Law No. 8 of 1999 on Consumer Protection, Law No. 11 of 2008 on Electronic Information and Transactions, and relevant scholarly literature. Data were analyzed through qualitative content analysis, comparing Indonesian legal provisions with international risk-based liability models, and reconstructing a coherent framework for high-risk autonomous AI. The findings reveal that fault-based liability is insufficient for AI ecosystems involving multiple actors and probabilistic decision-making, creating gaps in accountability and victim protection. The study proposes a risk-based liability model integrating strict liability for high-risk AI, joint and several liability, mandatory insurance, burden of proof reversal, and algorithmic transparency. This model is expected to enhance legal certainty, strengthen victim protection, and provide a regulatory foundation for responsible AI governance in Indonesia.

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### INTRODUCTION

The development of artificial intelligence technology demonstrates a fundamental transformation from rule-based systems to self-learning systems that operate through machine learning and deep learning (Pramana, Priastuty, Utari, Aziz, & Purwati, 2023). In its early stages, AI functioned as a tool that relied entirely on explicit human instructions, so its output was still predictable based on the initial design. However, the contemporary generation of autonomous AI can modify its internal parameters through data-driven optimization and reinforcement learning, resulting in decisions that are not always predictable by its creators. These autonomous characteristic shifts AI's position from being a mere passive instrument to a decision-making entity (Gitakarma & Tjahyanti, 2022). In global practice, autonomous vehicle systems were involved in a fatal accident in 2018 in Arizona when a driverless test vehicle hit a pedestrian; in the healthcare sector, deep learning-based AI systems are used for

radiological diagnosis, which in several studies has shown the potential for false positives and false negatives; Meanwhile, in the financial sector, credit scoring algorithms and automated lending have the potential to create systemic bias against certain groups (Assagaf & Prasetyo, 2026). This transformation in the nature of technology directly raises legal problems because the classical construction of liability is built on the assumption that harmful actions can always be traced to the will or negligence of a specific individual (Ehrenzweig, 2022; Giuffrida et al., 2017).

Theoretically, the doctrine of liability in Indonesian civil law still relies on the concept of fault (*schuld*) and causality, derived from Article 1365 of the Civil Code, which states that "Every unlawful act that causes harm to another person requires the person whose fault caused the loss to compensate for that loss" (Badruzaman, 2023). This norm emphasizes four main elements: the unlawful act, fault, loss, and causality. In the construction of liability based on fault, proving fault is a central element. Furthermore, Article 1366 of the Civil Code extends liability to negligence, while Article 1367 regulates vicarious liability, or responsibility for the actions of others or property under one's control. Beyond that, in certain contexts, the principle of strict liability is also recognized, such as in the consumer protection regime through Article 19 of Law Number 8 of 1999 concerning Consumer Protection (Simbolon, 2023). However, when autonomous AI makes decisions independently through a continuously evolving learning process, the attribution of fault becomes unclear. Developers can argue that the system has deviated from its initial design due to complex data interactions, while operators or end users may not have direct control over the system's internal decision-making process (Qurrahman, Ayunil, & Rahim, 2024). It is where proving causality becomes extremely complex, especially when harm results from the interaction of multi-layered, non-transparent algorithmic processes (the black box problem).

In Indonesian positive law, there is no explicit regulation regarding autonomous artificial intelligence as a separate legal category. The Civil Code, as the foundation of national civil law, does not recognize technological entities that act autonomously. AI is not a legal subject as defined by the classical doctrine that distinguishes between natural persons and legal persons. On the other hand, AI cannot be fully qualified as a passive object as referred to in Book II of the Civil Code, because it has adaptive capabilities and data-based decision-making (Amboro & Komarhana, 2021). Law Number 11 of 2008 concerning Electronic Information and Transactions, as amended by Law Number 19 of 2016, regulates the responsibilities of electronic system administrators in Article 15, but this norm is still general and does not specifically anticipate self-learning harm generated by autonomous systems (Elpina, 2024). This normative vacuum creates uncertainty regarding the basis for attribution of responsibility when losses arise not from direct human error, but from the algorithmic evolution of the system.

The problem becomes even more complex when analyzed within the framework of the AI ecosystem, which involves multiple actors, from software developers and hardware manufacturers, data providers, system operators, to corporate service providers and end users. Within this chain of responsibility distribution, fragmented liability is highly likely, where each party has only partial control over the system, making it difficult to designate a single party as primarily responsible (Haris & Tantimin, 2022). This situation opens up the potential for moral hazard, where each actor seeks to avoid legal liability by exploiting the system's technical complexity. In this context, the application of Article 1367 of the Civil Code concerning

liability for goods under supervision becomes problematic, as autonomous AI is no longer fully under direct human supervision after operating and learning dynamically in a real-world environment (Natalia, 2026).

Comparatively, several jurisdictions are beginning to develop new approaches. The European Union, through its risk-based regulation approach to AI governance, differentiates the risk levels of AI systems and proposes a stricter liability regime for high-risk AI systems, including discussions on strict liability and mandatory insurance for operators of high-risk systems (Rizki & Salam, 2023). At the academic level, the discourse on electronic personhood for certain autonomous systems has emerged, although it remains controversial. The risk-based approach reflects a shift from fault-based liability to risk liability, where responsibility no longer relies solely on proving moral culpability, but rather on the distribution of risk within a technological society. Compared to these developments, Indonesia still relies on classical normative constructions that have not integrated the logic of risk society into regulating AI liability (Putri, Nurmasitha, & Neisya, 2025).

The development of artificial intelligence (AI) technology demonstrates a fundamental transformation from rule-based systems to autonomous self-learning systems that operate through machine learning and deep learning. In the early stages, AI functioned as a tool entirely following human instructions, making its output still predictable. However, the current generation of autonomous AI can modify internal parameters through data-driven optimization and reinforcement learning, resulting in decisions not always predictable by their creators (Pramana et al., 2023; Gitakarma & Tjahyanti, 2022). This development has legal implications, as classical civil liability constructs are based on the assumption that every harm can be traced to the intent or negligence of a specific individual.

Legally, the doctrine of liability in Indonesian civil law still relies on the concept of fault (*schuld*) and causality, as stipulated in Articles 1365 to 1367 of the Civil Code. These articles emphasize the elements of unlawful acts, fault, damage, and causality as primary requirements for determining liability (Badruzaman, 2023; Simbolon, 2023). However, when autonomous AI independently generates decisions through continuously evolving learning processes, the attribution of fault becomes unclear. This creates difficulties in identifying responsible parties, especially within an AI ecosystem involving multiple actors, from developers to operators and end-users (Qurrahman et al., 2024; Natalia, 2026).

In global practice, several jurisdictions are beginning to adopt new approaches, such as the European Union's risk-based AI regulation, which differentiates AI risk levels and imposes stricter liability regimes for high-risk AI, including strict liability and mandatory insurance for operators (Rizki & Salam, 2023). Academically, discussions on electronic personhood for certain autonomous systems have emerged, though remain controversial. Compared to these developments, Indonesia still applies classical legal approaches, which have not yet integrated risk distribution logic into AI liability regulation (Putri et al., 2025).

The research gap is evident in the inability of Indonesian positive law to specifically regulate autonomous technological entities that may cause significant and systemic harm. Currently, AI is neither recognized as a legal subject nor a passive object, creating normative uncertainty in attributing responsibility. Furthermore, court procedures still place the burden of proof on victims, who often lack access to source code, training data, or algorithmic

mechanisms, widening the information asymmetry between victims and technology operators (Pane & Permana, 2025).

The urgency of this research arises from the increasing application of autonomous AI in high-risk sectors such as transportation, healthcare, and finance, which elevates the potential for harm to society. Existing regulations are insufficient to ensure legal certainty, victim protection, or operator accountability. This situation necessitates a conceptual and normative reconstruction of legal liability models that are compatible with the probabilistic and adaptive nature of autonomous AI (Haris & Tantimin, 2022; Cynthia & Soroinda, 2023).

The novelty of this research lies in formulating a risk-based liability attribution model for Indonesia's autonomous AI ecosystem, integrating risk classification, strict liability, mandatory insurance, joint and several liability, reversed burden of proof, and algorithmic transparency. This approach not only aligns the law with technological realities but also adopts relevant global practices while maintaining room for AI innovation (Vagansa et al., 2026).

The study aims to analyze the inadequacy of Indonesian positive law in attributing liability for damages caused by autonomous AI and to formulate a more adaptive legal reconstruction model. The expected benefits include enhancing legal certainty, strengthening victim protection, establishing a framework for risk-based AI regulation, and contributing academically to the discourse on technology law in Indonesia. Implementing this model is anticipated to provide a basis for developing specific AI regulations aligned with distributive justice principles and the risk-bearing obligations of commercial actors in high-risk environments.

## **METHOD**

This research employed a normative juridical approach, focusing on the analysis of positive legal norms, doctrines, and principles relevant to liability for damages caused by autonomous artificial intelligence systems. The study uses a combination of statutory and conceptual approaches. The statutory approach involves a systematic examination of regulations including Articles 1365, 1366, and 1367 of the Civil Code, Law Number 8 of 1999 concerning Consumer Protection, and Law Number 11 of 2008 on Electronic Information and Transactions, as amended by Law Number 19 of 2016. The population of the study comprises all existing legal provisions, academic literature, judicial decisions, and official government regulations related to AI liability in Indonesia. The research sample is selected purposively from these sources to focus on the most relevant and current norms and doctrines that directly address autonomous AI systems and associated legal responsibilities.

The primary research instruments are legal document analysis guides and conceptual frameworks for evaluating normative gaps, fault attribution, causality, and liability structures. Validity is ensured through triangulation of legal sources, cross-referencing statutory texts, scholarly opinions, and case law, while reliability is achieved by consistent application of the analytical framework to all selected legal texts. Data collection involves extracting relevant provisions, principles, and scholarly interpretations from the identified regulations, literature, and case studies. Procedures include coding legal norms according to their applicability to autonomous AI, classifying AI systems by operational risk levels, and mapping the attribution of liability among multiple actors in the AI ecosystem. All data extraction is documented systematically to ensure transparency and replicability of the analysis.

For data management and analysis, this study employs qualitative content analysis using NVivo software to organize legal norms and identify patterns, gaps, and conceptual inconsistencies. The analysis technique includes normative comparison, where Indonesian legal provisions are evaluated against international standards and risk-based liability models from jurisdictions such as the European Union. Conceptual reconstruction is applied to synthesize a coherent risk-based liability framework that integrates strict liability, joint and several liability, mandatory insurance, burden of proof reversal, and transparency obligations. The study also uses scenario analysis to illustrate how the reconstructed model can be applied in real-world cases involving autonomous AI, thereby providing a structured basis for legal reform and regulatory recommendations in Indonesia.

## **RESULTS AND DISCUSSION**

### **Disruption of Autonomous Artificial Intelligence Systems to the Structure of the Doctrine of Civil Law Liability**

The concept of "act" in Indonesian civil law is classically rooted in Article 1365 of the Civil Code (*KUHPerdata*), which states that "Every unlawful act that causes harm to another person requires the person whose fault caused the loss to compensate for that loss." This formulation implicitly assumes that the act (*daad*) is carried out by a legal subject with will and consciousness, namely a human or legal entity. Doctrinally, an act in the context of an unlawful act is always understood as an expression of human action that can be assessed normatively (Halipah, Purnama, Pratama, Suryadi, & Hidayat, 2023). In this construction, AI has been positioned as a tool (*instrumentum*), not an actor. However, autonomous artificial intelligence systems based on machine learning and reinforcement learning produce output that cannot always be traced to direct human instructions, but rather as the result of a dynamically evolving adaptive computational process. When an autonomous vehicle makes an avoidance decision that results in an accident, or a credit scoring system automatically rejects a credit application, the question arises as to whether such output can be qualified as an "act" within the meaning of Article 1365 of the Civil Code. AI does not possess will or moral intent, yet it produces actions that have real legal consequences. The tension arises because Indonesian civil law is anthropocentric, while autonomous AI operates as a decision-making system that functionally resembles an actor, although it is not a legal subject ontologically (Ravizki & Yudhantaka, 2022).

The problem becomes even more complex when linked to the element of fault (*schuld*), which is an essential requirement for liability under Article 1365 of the Civil Code and is expanded by Article 1366 of the Civil Code, which states that every person is responsible not only for losses caused by their actions but also for losses caused by their negligence or lack of care. In classical doctrine, fault includes *dolus* (intention) and *culpa* (negligence), measured by the reasonable person standard of care. However, in the context of self-learning systems, AI can make decisions never explicitly programmed by the developer and not even fully predictable at the design stage. The question is, can the developer be considered negligent if the system evolves through complex data interactions beyond initial predictions? Can errors be reconstructed as "design defects" or "algorithmic oversight errors"? This is where the nexus between human intent and the resulting consequences is lost. The *culpa* structure, which requires a deviation from the human standard of care, becomes obscured when the

consequences arise from a probabilistic, autonomous algorithmic process, rather than the conscious actions of a specific individual (Nugraha, Sadina, Ramadonna, & Hidayat, 2025).

Besides the element of fault, proving causality also faces significant conceptual pressure. In civil law, causality is generally analyzed through the theory of *conditio sine qua non*, which is corrected by the theory of adequate causation or proximate cause to limit overly broad causal chains. This structure is essentially linear, connecting one action to one consequence in a rational and traceable manner. However, in AI systems, causality is multi-layered and non-linear, involving interactions between training data, algorithmic parameters, model updates, user input, and the operational environment. The black box problem phenomenon makes it difficult for even system developers to explain in detail how a decision is made. Globally, investigations into autonomous vehicle accidents have shown that system decisions are the result of a combination of sensors, object recognition software, and complex environmental configurations. This situation creates multiple contributing causes, complicating the application of classical causality theory, as it is difficult to determine which factor is legally considered the proximate cause. Thus, the evidentiary structure in civil cases that requires a direct causal relationship faces epistemological challenges when applied to AI systems that operate probabilistically (Vagansa, Pancawati, Fadzillaturrachman, & Nugroho, 2026).

Attempts to place AI within the framework of Article 1367 of the Civil Code, which regulates liability for the actions of others or objects under their control, also raise conceptual issues. The article states that a person is not only responsible for losses caused by their own actions, but also for losses caused by those they depend on or by objects under their control. Traditionally, “objects” are understood as passive objects that are fully under the effective control of their owner or controller. However, autonomous AI is not a static object; it is an adaptive system that can independently update its internal parameters based on data interactions. Once operational, AI is not always under actual human control, but only under *ex ante* design control. This distinction between static objects and adaptive systems demonstrates the limitations of applying Article 1367 of the Civil Code to autonomous AI, as the basic assumption of the norm is effective control and direct preventative capacity by humans. When AI makes decisions independently in a dynamic operational space, the concept of supervision as a basis for attributing responsibility becomes inadequate, thus demonstrating a structural disruption to the classical doctrine of civil law liability (Putri A. N., 2025).

The tension between fault-based liability and strict liability becomes even more apparent when autonomous artificial intelligence systems are placed within the framework of Indonesian civil law. The fault-based liability structure, as formulated in Article 1365 of the Civil Code (*KUHPerdata*), requires an element of fault as the basis for compensation, while Article 1366 of the *KUHPerdata* emphasizes liability for negligence. This model is rooted in the assumption that every loss can be traced to a deviation from the standard of human behavior due to reasonable care. In contrast, the strict liability regime does not require proof of fault; instead, it suffices to prove the existence of the loss and a causal relationship to a risky activity. In national law, approaches similar to strict liability can be found, among others, in Article 19 of Law No. 8 of 1999 concerning Consumer Protection, which holds business actors responsible for consumer losses resulting from the goods and/or services they produce or trade. However, to date, there is no explicit norm categorizing the operation of autonomous AI as an ultra-hazardous activity that automatically triggers strict liability. Yet, AI operates in high-risk

environments, such as autonomous vehicles, algorithm-based medical systems, or automated financial systems, where the impacts can be massive and systemic. The absence of such a normative classification demonstrates a mismatch between the nature of technological risk and the liability paradigm, which is still oriented toward individual fault (Cynthia & Soroinda, 2023).

The next disruption is evident in the concept of supervision and control as the basis for attribution of responsibility. Article 1367 of the Civil Code states that a person is not only responsible for losses caused by their own actions, but also for losses caused by those they depend on or by objects under their control. This norm presupposes actual control over the subject or object that has the potential to cause harm. In the context of autonomous AI, human control is often limited to *ex ante*, that is, during the design, development, and configuration stages of the system (design control), while at the operational stage (*ex post*), the system can make decisions autonomously without direct human intervention. This loss of direct human control raises attribution problems, as the oversight that underlies Article 1367 of the Civil Code is no longer actual and continuous. Thus, the shift from actual control to design control challenges the fundamental assumption that responsibility always rests with the party directly controlling the action that causes harm. (Ghazmi, 2021)

Practically, this disruption also creates epistemic problems in the provision of evidence in court. Indonesian civil procedural law principally places the burden of proof on the party making the allegation (*actori incumbit probatio*), as reflected in Article 163 of the Indonesian Civil Code (HIR), which states that anyone claiming to have a right or citing an event to establish their right must prove the existence of that right or event. In cases involving autonomous AI, victims are often at a disadvantage because they lack access to the source code, training data, or algorithmic architecture that underpins the system's decisions. This knowledge gap between victims and technology corporations creates significant information asymmetry, making proving fault and causality nearly impossible without a reversal of the burden of proof mechanism or specific transparency obligations. Without a reformulation of the evidentiary mechanism, the structure of responsibility assignment in AI cases has the potential to reduce the effectiveness of legal protection for victims (Pane & Permana, 2025).

The phenomenon of autonomous AI demonstrates a structural disruption to the anthropocentric doctrine of civil legal liability. The elements of act, fault, and causality formulated in Articles 1365, 1366, and 1367 of the Civil Code experience conceptual pressure when applied to systems that lack moral will but are capable of independently generating legal consequences. This disruption is normative because existing norms do not explicitly anticipate the autonomous nature of algorithms; conceptual because basic assumptions about actors, control, and fault become problematic; epistemological because evidentiary mechanisms face limitations in access and transparency; and structural because the entire architecture of fault-based liability demonstrates systemic inadequacies in dealing with the non-linear and probabilistic realities of technology. Thus, the need for reconstruction extends not merely to the level of normative interpretation, but to a restructuring of the conceptual foundations of legal liability itself in a digital society.

## **Reconstruction of Risk-Based Liability Attribution Model in Autonomous Artificial Intelligence Ecosystem**

Reconstructing the liability attribution model in the autonomous artificial intelligence ecosystem must begin with a reorientation from the fault-based liability paradigm as stipulated in Article 1365 of the Civil Code to a risk-based liability model oriented toward risk distribution. Theoretically, this shift is consistent with the principle of enterprise liability, which assigns responsibility to entities that engage in risk-bearing activities while simultaneously deriving economic benefits from them. In a risk society, risk distribution can no longer be solely borne by victims through a fault-proof mechanism, but rather must be shifted to business actors who internalize the risk as part of their operational costs. The normative justification for this is the principle of distributive justice and the principle that profit-making parties are obligated to bear the burden of risk (risk-bearing capacity). Concrete actions that can be formulated include the development of new norms, either through amendments to the Civil Code or the creation of a specific Law on Artificial Intelligence, which states that organizers or operators of high-risk AI systems are responsible for losses incurred without the need for proof of fault. These norms must also classify certain autonomous AI as high-risk activities subject to a strict liability regime.

This reconstruction requires a clear and operational risk-tiering system. Legislators need to establish objective parameters such as potential impacts on life safety, public health, financial stability, and the protection of citizens' constitutional rights. Based on these parameters, AI in the autonomous transportation sector, automated medical diagnostic systems, and credit or financial scoring systems should be normatively categorized as high-risk AI. A concrete action would be to regulate that all high-risk AI systems must be registered with a supervisory authority before operation and automatically subject to a strict liability regime if they cause harm. Meanwhile, low-risk AI remains under a fault-based liability regime, ensuring this differentiation maintains a balance between victim protection and the sustainability of technological innovation.

In the context of an AI ecosystem involving multiple actors' software developers, hardware manufacturers, system integrators, operators, and service providers a liability attribution model must be designed to avoid fragmentation of responsibility that is detrimental to victims. A concrete action that can be adopted is the implementation of joint and several liability for all actors in the high-risk AI production and distribution chain, allowing victims to sue one or all parties involved without having to prove their own proportionate fault. For practical effectiveness, it is necessary to establish a primary liable party, namely the commercial operator who controls the implementation and derives direct economic benefit from the use of the AI system. Furthermore, an internal recourse mechanism can be regulated contractually or through statutory provisions, so that responsibility is shared among actors after compensation has been paid to victims.

As a more effective risk distribution instrument, mandatory insurance for high-risk AI operators is a crucial element in this reconstruction. This model is analogous to mandatory motor vehicle insurance, which aims to guarantee victim compensation without relying entirely on the solvency of the actor. A concrete action that can be formulated is a provision that every high-risk autonomous AI operator must have a civil liability insurance policy before the system is operational, and without proof of such insurance, the system cannot obtain an operational

permit. Furthermore, the establishment of an AI Compensation Fund funded through mandatory contributions from industry players could provide an additional scheme to guarantee compensation in cases of massive or systemic losses.

Reconstruction must also address epistemic problems by reversing the burden of proof and requiring algorithmic transparency. Given the inherent information asymmetry and black box problem, in disputes involving high-risk AI, the burden of proof should shift to the operator to demonstrate that the system has been designed and operated in accordance with technologically prudent standards. Other concrete actions include mandatory periodic independent algorithm audits, accessible documentation of training data and decision logs for evidentiary purposes, and administrative sanctions in the form of fines or license revocation if the operator fails to explain the system's decision-making process. Similarly, new prudent standards should be formulated in the form of technological due diligence, including mandatory pre-deployment risk assessments, algorithmic impact assessments, periodic safety testing, and the implementation of human oversight mechanisms for systems that significantly impact individual rights.

Finally, the proposed regulatory design is hybrid, integrating civil liability and administrative oversight through the establishment of a national AI supervisory authority with certification, registration, auditing, and operational license revocation powers. The recommended normative reconstruction model can be formulated as follows: low-risk AI remains subject to fault-based liability; high-risk AI is subject to strict liability accompanied by mandatory insurance and a reversed burden of proof; primary attribution rests with the commercial operator as the primary liable party with a recourse mechanism between actors; and audit and transparency obligations are operational requirements. This model concretely increases legal certainty through differentiation of liability regimes, strengthens victim protection through risk distribution and compensation guarantees, does not stifle innovation because not all AI is subject to strict liability, and aligns with global developments leading to risk-based regulation in artificial intelligence governance.

## **CONCLUSION**

The conclusion of this study confirms that autonomous artificial intelligence systems have caused structural disruption to the doctrine of Indonesian civil law liability, which has traditionally relied on the fault-based liability paradigm as formulated in Articles 1365, 1366, and 1367 of the Civil Code. The autonomous, self-learning, and probabilistic nature of AI has placed significant conceptual pressure on the elements of action, fault, and causality, rendering the anthropocentric construct, which presupposes human will and control, no longer fully compatible with technological realities. Furthermore, the absence of explicit provisions regarding autonomous AI in Indonesian positive law has created a normative vacuum and uncertainty in the attribution of responsibility, particularly in a multi-stakeholder ecosystem involving developers, manufacturers, integrators, operators, and service providers. Therefore, the problem faced is not merely a matter of implementing existing norms, but rather a structural problem in the conceptual foundation of legal liability, which requires reconstruction based on risk distribution, victim protection, and legal certainty in a digital society. Based on these findings, it is recommended that lawmakers formulate a specific regulatory framework for artificial intelligence that adopts a risk-based approach, by classifying high-risk AI and

establishing a strict liability regime for commercial operators as the primary liable party without requiring proof of fault. This regulation should be complemented by mandatory civil liability insurance, joint and several liability mechanisms in the production chain, a reversal of the burden of proof in certain disputes, and mandatory audits and algorithmic transparency as part of technology due diligence standards. Furthermore, the establishment of a national AI supervisory authority with registration, certification, and administrative oversight powers is a concrete step to ensure the integration of civil liability and regulatory control. With a normative design that differentiates between low-risk and high-risk AI, this reconstruction is expected to strengthen victim protection while maintaining a climate of innovation and legal certainty in artificial intelligence governance in Indonesia.

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