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LEGAL CHALLENGES OF SMART CONTRACT INTEGRATION IN INDONESIAN NOTARIAL PRACTICE

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ABSTRACT

This research aims to analyze, the legal framework required for the implementation of smart contract technology in the execution of authentic deeds and the implications of smart contract adoption on the authority, responsibility, and role of the notary as a public official. This study employs normative legal research with a statutory approach, a conceptual approach, and a comparative law approach. The results indicate that smart contracts are conceptually categorized as agreements, provided they fulfill the validity requirements as stipulated in Article 1320 of the Civil Code (Kitab Undang-Undang Hukum Perdata). However, the necessary legal framework requires harmonization between the Civil Code, the Notary Office Act, and the Electronic Information and Transactions (EIT) Act, including regulations on electronic signatures and digital certificates to ensure legal certainty and protection. The novelty of this study lies in its conceptualization of the notary as a "digital gatekeeper" who bridges the automated, immutable "code-is-law" mechanism with the qualitative, subjective requirements of civil law (such as free will and legal capacity) which algorithm-driven systems inherently lack. The implementation of smart contracts does not eliminate the notary's authority; rather, it fosters a transformation of the notary's role from a mere deed-maker to a guardian of legal legitimacy for digital transactions. Notaries retain the fundamental authority to ensure the fulfillment of legal requirements for agreements and to provide both preventive and repressive legal protection for the parties involved. This study contributes scientifically by offering a synchronized regulatory model rooted in Progressive Law theory, serving as a conceptual blueprint for future civil law legislative reforms in mitigating blockchain disruption. Consequently, integrating smart contracts into notarial practice necessitates regulatory updates capable of bridging the principle of deed authenticity with digital technological advancements to guarantee legal certainty, justice, and utility in the digital era.

Keywords: *digital gatekeeper****; legal framework; notarial deed;*** *progressive law;* ***smart contract.***

1. INTRODUCTION

The digital revolution has necessitated profound structural adaptations across public administration and legal sectors, particularly concerning how legal agreements are formulated, preserved, and executed. Blockchain technology and its derivative application, the smart contract, have introduced a decentralized paradigm where

contractual obligations are coded and executed automatically upon the fulfillment of predefined parameters, entirely bypassing human or third-party intermediaries. While this technology significantly optimizes transactional speed, operational transparency, and cryptographic security, its incorporation into the framework of civil law jurisdictions—such as Indonesia—presents a profound ontological friction. The constitutional guarantee of legal certainty, as enshrined in Article 28D paragraph (1) of the 1945 Constitution of the Republic of Indonesia, demands that any legal instrument, physical or electronic, must possess verifiable integrity and strict adherence to the rule of law. [1] Consequently, the juxtaposition of an unyielding digital algorithm against the highly nuanced, human-centric processes of the notary profession creates a pressing legal dilemma. [2]

The core of this dilemma lies in the fundamental nature of authentic deeds within the civil law tradition. Under the Notary Office Act (*Undang-Undang Jabatan Notaris*—UUJN), an authentic deed is not merely an administrative record but a vital instrument of preventive justice that requires active human intervention to verify material truth, assess the parties' capacity, and ensure the absolute clarity of consent. Conversely, smart contracts operate on a strict "code-is-law" logic where automated parameters cannot interpret subjective civil elements such as free will or a lawful cause (*causa*) required under Article 1320 of the Indonesian Civil Code. Furthermore, statutory mandates under Articles 48 and 49 of the UUJN strictly prohibit alterations to a deed's *minuta* without rigorous formal procedures, a rule that stands in direct opposition to the immutable yet technologically fragile nature of blockchain records which are susceptible to algorithmic bugs, identity theft, and systemic digital force majeure. [3]

To contextualize this problem, existing legal scholarship has engaged with various dimensions of legal technology and notarial evolution. General studies by Corrales, Fenwick, and Haapio have extensively mapped the global expansion of legal tech and blockchain applications in commercial transactions. In the domestic sphere, Mazalio identified the initial compatibility challenges emerging between automated smart contracts and the traditional roles of Indonesian notaries. [4] Similarly, Muko analyzed the positioning of smart contracts within positive law, focusing heavily on the technical risks of electronic document manipulation and forgery under Government Regulation No. 71 of 2019. From a structural perspective, Borman evaluated the statutory positioning of the notary as a public official, while Devita addressed the

[1]Gladysha Indahcantika Mazalio, "Problematika Penerapan Smart Contract terhadap Peran dan Fungsi Notaris di Indonesia," *Jurnal Multidisiplin Indonesia* 2, no. 3 (March 2023): 635.

[2]Marcelo Corrales, Mark Fenwick, and Helena Haapio, *Legal Tech, Smart Contracts and Blockchain* (Singapore: Springer Singapore, 2019), 20.

[3]The 1945 Constitution of the Republic of Indonesia, Article 28D paragraph (1).

[4]Habib Adjie, *Hukum Notaris Indonesia: Tafsir Tematik Terhadap UU No. 30 Tahun 2004 tentang Jabatan Notaris* (Bandung: Refika Aditama, 2008), 44–46.

broader macro-disruptions facing the authority and boundaries of the notarial office in the digital era. [5]

Despite these valuable insights, a critical academic gap persists in current legal literature. Prior research has primarily focused on either a superficial defense of the traditional notarial office against technological replacement or an abstract critique of the legislative vacuum. There is a distinct lack of deep, systematic inquiry into how the precise statutory requirements of deed authenticity—such as physical presence (*comparitio*), the mandatory reading of the deed to the parties, and the preservation of perfect evidentiary force (*volledig bewijskracht*)—can be technologically and normatively reconciled with the decentralized architecture of smart contracts. [6] Existing studies fail to offer a concrete, synchronized regulatory model capable of integrating blockchain mechanisms without eroding the notary's public authority and civil liability as defined under Article 65 of the UUJN. [7]

This study directly addresses this gap by introducing a novel conceptual framework that repositions the notary as a **"digital gatekeeper"** within the blockchain ecosystem. Grounded in the Progressive Law theory pioneered by Satjipto Rahardjo, this research treats the law not as an immovable, stagnant set of dogmas, but as a dynamic social instrument that must continuously adapt to fulfill substantive justice and public utility. By shifting the academic focus from technological resistance to regulatory harmonization, this article demonstrates how smart contracts can be utilized as supplementary analytical tools to streamline notarial workflows while preserving the indispensable human verification of contractual balance, informed consent, and legal legitimacy.

Consequent to this background, this article systematically investigates two interconnected legal questions: (1) What normative legal framework must be established to satisfy the statutory requirements of authentic deeds when integrating smart contract technology into the Indonesian legal system; (2) What are the structural and civil implications of smart contract adoption on the authority, responsibility, and role of the notary as a public official?

2. RESEARCH METHOD

This study employs normative legal research, [8] conceptualizing law as a coherent system of statutes, principles, and doctrines (*law in books*). To effectively address the intersection of blockchain technology and notarial authority, a prescriptive-

[5] Philipus M. Hadjon, *Perlindungan Hukum bagi Rakyat di Indonesia* (Surabaya: PT Bina Ilmu, 1987), 38.

[6] M. S. Borman, "Kedudukan Notaris Sebagai Pejabat Umum Dalam Perspektif Undang-Undang Jabatan Notaris," *Jurnal Hukum Dan Kenotariatan* 3, no. 1 (2019): 74–83, accessed via https://doi.org/10.33474/hukeno.v3i1.1920.

[7] Adam Muko, "Kajian Smart Contract Dalam Perspektif Hukum Positif Di Indonesia," *Doktrin: Jurnal Dunia Ilmu Hukum dan Politik* 2, no. 2 (April 2024): 22.

[8] Amirudin and Zainal Asikin, *Pengantar Metode Penelitian Hukum*, 9th ed. (Depok: PT Rajagrafindo Persada, 2016), 118.

descriptive research design is applied to formulate normative solutions for current legislative lacunae. [9] This study utilizes a synchronized tri-fold analytical approach. [10] First, the statute approach [11]is applied to evaluate the harmonization and vertical integration of relevant Indonesian legislation, primarily the Indonesian Civil Code (*KUHPerdata*), the Notary Office Act (UUJN), and the Electronic Information and Transactions (EIT) Act. Second, the conceptual approach[12] is employed to deconstruct traditional doctrines surrounding deed authenticity, public official liability, and the "code-is-law" paradigm through the theoretical lens of Progressive Law, moving beyond rigid textual boundaries to understand the broader legal intent behind notarial functions. Third, the comparative approach[13] is practically implemented by benchmarking Indonesia's current legal framework against advanced digital jurisdictions, specifically Estonia, representing civil law electronic notarization models, and the United States (with emphasis on Delaware legislation), representing pioneer frameworks for corporate blockchain and smart contract recognition. Secondary legal materials were gathered through exhaustive library research, categorizing statutory instruments as primary sources, while academic literature, expert opinions, and legal journals serve as secondary sources. The collected materials were processed through logical systematization and analyzed qualitatively using grammatical, systematic, and teleological legal interpretation methods to bridge the operational friction between immutable smart contracts and flexible civil law requirements. The grammatical interpretation analyzes the literal definitions of electronic transactions, systematic interpretation connects the EIT Act with the UUJN, and teleological interpretation evaluates the ultimate socio-economic purpose of digitalizing authentic evidence. Ultimately, the final analysis is strictly prescriptive, delivering a structured normative blueprint that defines the legal boundaries of automated contract execution and establishes the parameters of civil, criminal, and administrative liability of notaries within a decentralized digital framework.

3. DISCUSSION

3.1. The Legal Framework Required for the Application of Smart Contract Technology in the Execution of Authentic Deeds

The rapid social shifts driven by technological advancements necessitate innovative and creative adaptations to ensure public benefit. This includes the notarial profession, which plays a pivotal role in providing legal services related to the drafting of agreements. To enhance efficiency, notaries must embrace "legaltech" specifically,

[9]Soerjono Soekanto, *Penelitian Hukum Normatif* (Jakarta: PT Raja Grafindo Persada, 2006), 13–14.
[10]Soerjono Soekanto, *Pengantar Penelitian Hukum* (Jakarta: UI Press, 2008), 50–51.
[11]Salim HS and Erlies Septiana Nurbani, *Penerapan Teori Hukum Pada Tesis dan Disertasi* (Jakarta: Raja Grafindo Persada, 2013), 17–18.
[12]*Ibid*
[13]Muhaimin, *Metode Penelitian Hukum*, 1st ed. (Mataram: UPT Mataram University Press, 2020), 49.

artificial intelligence (AI) products such as smart contracts. This technology features a contract generator system capable of drafting comprehensive contracts with high legal accuracy. Such systems ensure that standardized contracts utilize precise legal terminology, thereby fostering a balance between the parties regarding the legal substance of their agreement.

The concept of smart contracts is not a recent phenomenon; it was introduced by Nick Szabo in the early 1990s. Szabo defined a smart contract as an agreement translated into digital form—or a digital contract—that is executed automatically. Its primary purpose is to function as a computerized transaction protocol that enforces the terms of a contract without human intervention.[14]

In its development, Szabo recognized that blockchain network technology provides the necessary security for smart contract systems. A paradigmatic illustration of this mechanism is a lease agreement. Through blockchain, parties receive a virtual receipt (token) representing the contract. The lessor provides a digital entry key, which the lessee receives at a predetermined date and time. If the key is not used or becomes unavailable within the specified timeframe, the blockchain system automatically revokes it. This system operates on a "cause-and-effect" logic, fostering trust and security. Furthermore, the code cannot be altered by one party without the other's knowledge, as the decentralized system provides simultaneous information to all stakeholders.[15]

Consequently, smart contracts operate by analyzing data to prevent deviations from agreed-upon terms. The system generates a decision and records it in code, which requires verification and consensus from all parties. Subsequently, organized storage prevents forgery or data redundancy. The primary advantages of integrating AI and blockchain in smart contracts include transparency, trust, guaranteed automatic execution, efficiency, and systematic data archiving, all of which provide a robust sense of security for the parties involved.

Such technology holds significant potential for implementation within the notarial profession. Under Article 15 of the Notary Office Act (UUJN), a notary is authorized to create authentic deeds for all acts, agreements, and stipulations required by law or desired by interested parties. This authority includes ensuring the certainty of the deed's date, storing the deed, and issuing *grosse* (executory copies), transcripts, and extracts. Moreover, notaries possess the authority to certify electronic transactions (cyber notary), draft waqf (endowment) pledge deeds, and handle aircraft mortgages.

As previously discussed regarding AI algorithms, the input of data is fundamental. Data entered into the system is stored and serves as a learning source for machines to analyze various documents. The presence of AI-based technology can streamline

[14]J. H. Bergquist, *Blockchain Technology and Smart Contracts* (Uppsala: Uppsala Universitet, 2017), 18–22.

[15]Margaretha Donda Daniella, "Penggunaan Smart Contract sebagai Alternatif dalam Proses Penawaran Jual Beli Properti di Indonesia" (Thesis, Universitas Airlangga, 2019), 25.

a notary's workflow in drafting deeds containing both specific clauses and general provisions. This eliminates the need for repetitive drafting of standardized clauses. Legally, any contract drafted—whether digital or physical must contain clauses governing the legal relationship between two or more parties based on mutual consensus to create rights and obligations that must be fulfilled.[16]

The drafting of legal instruments, such as contracts or deeds, can now be facilitated through smart contracts utilizing keyword integration, legal research tools, and regulatory technology (regtech). The system's accuracy in predicting relevant clauses based on specific keywords is heavily contingent upon the volume and comprehensiveness of the data provided as input for the Artificial Intelligence (AI) literacy. Furthermore, agreements executed as deeds benefit from guaranteed security throughout the transmission and storage processes. This is due to the requirement for consensus-based verification by all involved parties for any modification. Additionally, the integration of technology enables "temporal transparency" through automated **timestamps** recorded for every digital transaction. Consequently, the function of witnesses in a notarial deed is optimized, reinforcing the notary's primary responsibility to ensure the veracity of the instrument's execution time.

In exercising their office, Notaries rely strictly on statutory provisions. However, specific regulations governing notarial duties within the digital sphere remain absent, posing legal risks to both the Notary and the parties involved. Nevertheless, optimism regarding technological utilization must be maintained and balanced with relevant research and digital adaptation within the profession. As public awareness of technology influences all sectors, Notaries are expected to play a pivotal role in enhancing transaction efficiency to improve Indonesia's ranking in the Ease of Doing Busi**ness** index.

The existence of an authentic deed in the civil law system is fundamentally an instrument for the protection of rights rather than a mere administrative document. Authentic deeds ensure certainty of identity, intent, content, and date all of which shield parties from potential future disputes. Following the theory proposed by Philipus M. Hadjon, legal protection comprises preventive and repressive measures. Both must be present simultaneously in the design of smart contract regulations to ensure that the protective function of an authentic deed is not diminished by automation.

On a preventive level, legal protection requires a normative framework to prevent rights violations before a legal relationship is executed. In the context of smart contracts, this preventive dimension is more complex than conventional deeds, as verification shifts from physical interaction before a Notary to electronic systems vulnerable to identity theft, data manipulation, and algorithmic errors. Without detailed regulations on digital identity authentication, certified electronic signatures,

[16]Salim H.S., *Hukum Kontrak: Teori dan Teknik Penyusunan Kontrak*, 14th ed. (Jakarta: Sinar Grafika, 2019), 95.

and informed **consent** mechanisms, preventive protection remains weak. The use of smart contracts must not eliminate the Notary's role as a guardian of contractual balance; instead, it should strengthen it through rigorous digital verification, periodic system audits, and platform security certifications.

a. Self-Executing Character and Structural Models

The **self-executing** nature of smart contracts poses significant challenges. While traditional agreements allow for renegotiation in light of changed circumstances, smart contracts execute automatically once parameters are met. If regulations do not provide for legal intervention—such as an **escape mechanism** or a **pause function** to halt execution in cases of fraud, error, or "digital force majeure," the technology may become a rigid and repressive instrument.

In practice, smart contracts operate under two models:

1. External Model: Conventional textual agreements are translated into cryptographic code. The code acts as an execution instrument for the pre-existing agreement.[17]
2. Internal Model: The entire contract is drafted as code from its inception. In this model, the programming code possesses direct binding force, embodying the concept of "code as law" or "code as contract."[18]

b. Legal Basis of Smart Contracts under the Indonesian Civil Code

Article 1313 of the Indonesian Civil Code (KUH Perdata) defines an agreement as "an act by which one or more persons bind themselves toward one or more other persons." Based on this definition, a smart contract inherently qualifies as a legally recognized agreement. In its application, the parties engaging in a smart contract indirectly establish a binding legal relationship (*perikatan*), as the digital consensus represents a meeting of minds.

c. Progressive Law Perspective: Adaptation and Innovation

The implementation of smart contract technology in notarial services is a concrete manifestation of the Progressive Law theory introduced by Prof. Dr. Satjipto Rahardjo. This theory posits that law is a social instrument that must continuously evolve and adapt to societal dynamics. Progressive law views the legal system not as a rigid set of norms, but as a means to achieve substantive goals: justice, utility, and human welfare. Therefore, the law must remain responsive to technological advancements, including blockchain-driven digitalization.

The emergence of smart contracts reflects both a challenge and an opportunity for the legal system to remain relevant. This technology aligns with the spirit of progressive law by facilitating efficient, secure, and transparent legal services. While conventional deed preparation is often perceived as bureaucratic and time-consuming,

[17] *See* Massimo Ragnedda and Giuseppe Destefanis (Eds), *Blockchain and Public Administration: The Next Frontier of Digital Services*, (Routledge, 2020), p. 112. (Atau sesuaikan dengan sumber asli Anda mengenai model eksternal).

[18] Lawrence Lessig, *Code: And Other Laws of Cyberspace*, (Basic Books, 1999); *see also* Primavera De Filippi and Aaron Wright, *Blockchain and the Law: The Rule of Code*, (Harvard University Press, 2018), p. 20.

smart contracts offer a new paradigm where agreements are executed automatically based on agreed-upon code. This minimizes human error and limits the potential for abuse of authority. Normatively, the legitimacy of smart contracts is supported by the "open nature" of Book III of the Indonesian Civil Code, which upholds the principle of freedom of contract, provided the essential requirements of Article 1320 (consent, capacity, a specific object, and a lawful cause) are fulfilled.

d. Evidentiary Value and the Evolving Role of the Notary

The adoption of smart contracts should be viewed as a supporting mechanism to enhance notarial services rather than a threat to the profession. Nevertheless, integrating this technology into the notarial system—with evidentiary weight equivalent to an authentic deed requires a reformulation of the Notary Juvenile Law (UUJN).

Regarding evidentiary strength, Article 5 of Law No. 11 of 2008 (as amended by Law No. 1 of 2024) on Electronic Information and Transactions (ITE Law) stipulates that electronic information, documents, and their printouts are valid legal evidence. Consequently, smart contracts possess the same evidentiary value as conventional agreements, whether in digital code or printed form. Furthermore, according to Minister of Communication and Informatics Regulation No. 11 of 2018, electronic certificates serve to verify the identity of the parties and the integrity of the documents. Under the elucidation of Article 15 paragraph (1) of the UUJN, Notaries are empowered to perform such verifications, ensuring that digital transactions result in authentic evidence with perfect evidentiary force (*volledig bewijskracht*).

3.2. Implications of Smart Contract Implementation on the Authority, Responsibility, and Role of the Notary as a Public Official

a. Implications of Smart Contract Implementation on Notarial Authority

Notaries hold a vital position and role within the state and society, as they possess specific authority (*attributio*) mandated by statutory regulations. A Notary is constructed as a public official tasked with serving the public interest. The scope of this authority is explicitly defined in Article 15 of Law Number 2 of 2014 concerning the Amendment to Law Number 30 of 2004 concerning the Office of Notary (UUJN). This authority includes: drafting authentic deeds, guaranteeing the certainty of the date of the deed, storing deeds, issuing *grosse* (first formal copies), providing copies and excerpts of deeds, legalizing under-hand documents (*legalisatie*), registering under-hand documents in a special book (*waarmerking*), certifying copies of original documents, providing legal counseling regarding deed preparation, and other authorities regulated by law. These powers solidify the Notary's position as a central actor in ensuring legal certainty, order, and protection in civil law relationships.

However, as society evolves, the exercise of this authority faces new dynamics due to the rapid advancement of information technology. A primary example is the emergence of blockchain-based smart contracts, which bring fundamental changes to the practice of drafting and executing agreements.

Smart contracts enable contractual clauses to be executed automatically without human intervention once specific conditions are met. This condition raises questions regarding the relevance and boundaries of a Notary's authority as a public official traditionally authorized to create authentic deeds. Normatively, a Notary's authority does not merely lie in the act of transcribing the parties' intentions into written form; it also encompasses the authority to ensure that the legal requirements of a valid contract under Article 1320 of the Indonesian Civil Code are met—namely: mutual consent, legal capacity, a specific object, and a lawful cause (*causa*).

Technologically, a smart contract functions as a technical instrument for automated execution; it lacks the cognitive or legal capacity to evaluate "free will," legal competence, or the alignment of the *causa* with positive law. Therefore, the implementation of smart contracts does not inherently abolish notarial authority. Because smart contracts operate based on "if-then" logic, they cannot assess the juridical and sociological aspects that are prerequisites for a valid agreement. Consequently, the Notary's authority remains fundamental and irreplaceable by technology.

The implementation of smart contracts carries implications in the form of a shift and transformation of notarial authority. Notaries are no longer limited to the creation of conventional paper-based deeds; they are now required to understand and accommodate the use of digital technology in legal transactions. In this context, the Notary's authority may evolve into the verification and legalization of smart contract-based agreements, particularly in ensuring that the substance of the agreement complies with national law.

In other words, smart contracts drive an expansion of the Notary's function from a mere "deed maker" to a legal authority providing legitimacy to electronic transactions. Conversely, the absence of explicit regulations regarding smart contracts in the UUJN poses a challenge to the legal certainty of notarial authority. Without a clear legal basis, a Notary's involvement in smart contracts could trigger debates regarding the limits of their office and inherent legal responsibilities. Therefore, the application of smart contracts in notarial practice necessitates regulatory adjustments to ensure that the Notary's authority maintains a solid legal foundation and remains consistent with the principle of legality.

b. Implications of Smart Contract Implementation on Notarial Responsibility

The implementation of smart contracts has a direct impact on the dimension of notarial responsibility. Given that the personal and legal data of parties processed within a smart contract system are vulnerable to misuse if not protected by adequate

security measures, data security and confidentiality protection become paramount. Smart contracts, typically operating on blockchain technology, are automated, distributed, and immutable; consequently, data input errors or unauthorized access may result in permanent consequences that are difficult to rectify. In the context of notarial practice, this creates significant legal risks, particularly regarding the Notary's obligation to maintain the confidentiality of deeds and client data as mandated by the **Law on the Office of Notary (UUJN)**. However, within the framework of smart contracts, the scope of this responsibility becomes more complex. The Notary remains responsible for ensuring that the agreement—whether drafted as a conventional deed or integrated with a smart contract—does not violate the law, public order, or morality. This responsibility is juridical in nature and cannot be transferred to a technological system. Thus, even if the agreement is executed automatically by program code, the responsibility for the validity of the contract's substance remains with the Notary if the agreement was drafted or legalized by them.[19]

Regarding legal liability, the use of smart contract technology in the creation of authentic deeds carries specific consequences for the Notary. From a civil law perspective, notarial responsibility can be linked to Article 1367 of the Indonesian Civil Code, which regulates vicarious liability for parties who own or control an object. In the context of smart contracts, the Notary can be positioned as the party controlling the use of such technology in the creation of authentic deeds, thereby remaining obligated to exercise supervision to prevent errors or losses for the parties.[20]

Furthermore, Article 1365 of the Indonesian Civil Code affirms that every unlawful act (*onrechtmatige daad*) that causes damage obligates the party at fault to provide compensation. If the execution of a smart contract results in losses due to the Notary's negligence in verifying the substance of the agreement or supervising the technology, the Notary may be held civilly liable. **Article 65 of the UUJN** further emphasizes that the responsibility for a deed remains with the Notary, even after the original deed (*minuta*) has been stored in the notarial protocol. Consequently, the use of a smart contract as a tool does not eliminate or reduce the Notary's legal liability for the authentic deeds they produce.[21]

Furthermore, the legal liability of a Notary in the use of smart contract technology can be classified into four aspects: civil law, criminal law, administrative and professional ethics, and electronic information and transaction law.

[19]Patricia Jessica, *CyberNotary Dan Digitalisasi Tanda Tangan* (Yogyakarta: Deepublish Digital, 2024), p. 66.

[20]Azhara Afrihani, Pande Yogantara S, and I Gusti Ngurah Parikesit Widiatedja, "Tanggung Jawab Notaris Dalam Memberikan Perlindungan Data Pribadi Para Pihak," *Acta Comitas: Jurnal Hukum Kenotariatan* 9, no. 01 (2024): 115-126. DOI: 10.24843/AC.2024.V09.I01.P9, p. 120 (accessed January 5, 2026).

[21]Made Dwiki Gangga and I Putu Rasmadi Arsha Putra, "Kekuatan Pembuktian Akta Autentik Yang Dibuat Oleh Notaris Pengganti," *Acta Comitas: Jurnal Hukum Kenotariatan* 8, no. 03 (2023): 555-565. DOI: 10.24843/AC.2023.V08.I03.P12, p. 560 (accessed January 5, 2026).

1. Civil Aspect: Responsibility arises in cases of breach of contract (*wanprestasi*) as regulated in Article 1234 of the Civil Code or unlawful acts under Article 1365. The Notary may be required to provide compensation, fulfill performance, or cancel the agreement if their negligence in using a smart contract causes loss to the parties.
2. Criminal Aspect: Liability may arise if the use of a smart contract involves criminal acts, such as the forgery of deeds or documents as regulated in Articles 263 and 264 of the Criminal Code (KUHP), which carry penalties of up to eight years in prison. Additionally, Articles 372 and 374 regulate embezzlement, while Article 242 penalizes the provision of false testimony under oath. If a smart contract is used as a vehicle for such acts, the Notary may still be held criminally liable.
3. Administrative and Ethical Aspect: Using smart contract technology in a manner inconsistent with the UUJN and the Notarial Code of Ethics may lead to administrative sanctions under Article 41 of the UUJN, ranging from warnings to dismissal. The Notarial Supervisory Board (*Majelis Pengawas Notaris*) has the authority to impose sanctions if a Notary is proven to have violated their official duties. Moreover, a deed created without fulfilling legal requirements risks losing its evidentiary force as an authentic deed or may even be declared null and void by law.
4. Electronic Information and Transaction Law Aspect: The implementation of smart contracts must comply with the ITE Law, the Personal Data Protection (PDP) Law, and Government Regulation Number 71 of 2019 regarding the Implementation of Electronic Systems and Transactions. The PDP Law emphasizes the obligation to protect personal data processed through electronic systems, while PP 71/2019 requires electronic system providers to ensure the security, reliability, and accountability of the systems used. In this context, the Notary bears full responsibility for data protection and the validity of deeds drafted with the assistance of smart contract technology.

Thus, it can be affirmed that while smart contract technology may be utilized to enhance efficiency and certainty in contract execution, full responsibility for the validity, accuracy, and legal consequences of an authentic deed remains with the Notary, as emphasized in Article 65 of the UUJN. The use of smart contracts does not erase civil, criminal, administrative, or ethical liabilities; rather, it demands a higher degree of prudence (*kehati-hatian*) in exercising the notarial office in the digital era.

However, a clear distinction must be made between the Notary's legal responsibility and the technical responsibility of smart contract programming. Code errors (bugs), system failures, or security vulnerabilities on the blockchain are essentially technical domains outside the competence of the Notarial office. Therefore, as long as the Notary is not directly involved in the programming process and has exercised the

prudential principle, they cannot be held liable for technical failures. This distinction is vital to avoid a disproportionate expansion of liability that could disadvantage the Notarial profession. Furthermore, the use of smart contracts may trigger administrative and ethical liability if a Notary legalizes or participates in a smart contract without understanding its legal implications or fails to provide a legal explanation to the parties. Therefore, the adoption of smart contracts necessitates an increase in the competence and caution of Notaries in performing their duties.

c. Implications of Smart Contract Implementation on the Role of the Notary as a Public Official

From a functional perspective, smart contracts do not necessarily diminish the standing of the Notary as a public official; rather, they provide an avenue to strengthen the Notary's strategic role within the digital legal ecosystem. The Notary maintains a central position as the guarantor of legal certainty and protection, particularly in high-value transactions with complex legal implications. In the context of smart contracts, the Notary's role evolves into a guardian of legal legitimacy for digital transactions, bridging the gap between technological innovation and a national legal system still rooted in conventional principles. Thus, the Notary acts not only as a drafter of deeds but also as a legal advisor who assists parties in navigating the legal consequences of automated agreements.

The implementation of smart contracts introduces a fundamental shift in the construction of the Notary's role. While technology automates the execution of contractual clauses, this automation only addresses the technical performance of the agreement, not the juridical essence that underlies the legal relationship. Consequently, the Notary's role becomes increasingly strategic in ensuring that the parties' intentions—embodied in the smart contract—fulfill the legal requirements for a valid contract under Article 1320 of the Indonesian Civil Code.

Furthermore, since smart contracts lack the capacity to evaluate subjective legal elements such as free will (consent), legal capacity, and the lawfulness of the cause (causa), technology cannot replace the juridical and sociological functions inherent in the Notarial office. In this capacity, the Notary serves as a legal gatekeeper, ensuring that digital transactions are not only technically functional but also legally valid and accountable.

The "automatic, final, and immutable" characteristics of smart contracts demand a high degree of legal understanding before a contract is deployed. Here, the preventive role of the Notary is crucial to mitigate future disputes arising from information asymmetry or technological misconceptions. This transformation requires Notaries to adapt professionally, moving away from a passive or defensive stance toward technology to a conceptual understanding of how smart contracts function. This

modernization does not aim to turn Notaries into IT experts but to ensure that notarial authority remains effective in a digital environment.

Drawing from the Legal Effectiveness Theory by Soerjono Soekanto, the successful integration of smart contracts into notarial authority depends on the harmony between five interrelated factors:

1. Legal Substance: The existence of clear and adaptive regulations (reform of the UUJN).
2. Legal Structure: The readiness of institutions and enforcement agencies to supervise digital norms.
3. Facilities and Infrastructure: The availability of secure and equitable technological support.
4. Society: The level of digital literacy among users.
5. Legal Culture: The readiness of the public and the profession to accept a paradigm shift toward digital mechanisms.

Without synchronizing these factors, the Notary's authority risks becoming distorted nominally present but factually weakened. While the Notary might formally retain responsibility, they may practically lose control over automated systems.

In the perspective of Progressive Law, this transition should be viewed as an effort to strengthen the social and juridical function of the Notary in providing public protection. Technology should not be seen as a replacement for the Notary, but as a supporting instrument to realize more effective, transparent, and accountable notarial services. Therefore, any legal reform regarding smart contracts must be comprehensive and systemic, ensuring that the law remains a living instrument that works in practice (*law in action*) rather than a mere formal norm that is ineffective in social reality.

4. CLOSING

4.1. Conclusion

The implementation of smart contract technology in the creation of authentic deeds must be situated within a legal framework aligned with the national legal system, specifically the Indonesian Civil Code (KUHPerdata), the Law on the Office of Notary (UUJN), and the ITE Law. By nature, a smart contract is a technical instrument for automation; thus, it cannot be equated with an authentic deed as defined under Article 1868 of the Indonesian Civil Code. Currently, a legal vacuum exists in Indonesia due to the absence of explicit regulations governing the use of smart contracts in notarial practice. This void creates hesitation among Notaries to adopt the technology to avoid potential legal risks. Consequently, regulatory harmonization is required to provide a legal basis while upholding the principles of legality and deed authenticity. The adoption of smart contracts does not eliminate or diminish the authority of the Notary

as a public official; instead, it triggers a transformation of their role. The Notary remains the central figure in ensuring legal certainty and protecting the parties involved. In the digital ecosystem, the Notary's role evolves from a mere "deed maker" into a legal verifier and guarantor. This responsibility includes verifying digital identities, assessing legal capacity, validating free will, and ensuring that the substance of the agreement does not violate positive law. From a progressive law perspective, technology should be viewed as a tool to achieve utility and justice, rather than a hindrance to innovation. The integration of smart contracts into notarial services demands professional adaptation from Notaries to realize services that are more efficient, transparent, and accountable. The success of this transformation heavily depends on the synchronization between legal substance, institutional readiness, and the legal culture of society in responding to the paradigm shift of the digital era.

4.2. Recommendation

To bridge the normative gap between blockchain automation and the civil law framework in Indonesia, three interconnected strategic measures are recommended. First, the legislature must urgently amend the Notary Office Act (UUJN) to establish explicit legal standing for *cyber notary* practices and smart contract integration, harmonizing it with the EIT Act and the PDP Law to ensure that the evaluation of subjective civil validity under Article 1320 of the Civil Code remains an exclusive human-centric notarial authority. Second, the government, in collaboration with the Indonesian Notary Association (INI), should develop a state-certified, closed blockchain infrastructure inspired by Estonia's e-notarization model, incorporating built-in cryptographic audit trails and "pause protocols" to allow legal intervention in cases of fraud or digital force majeure. Third, the INI and academic institutions must comprehensively restructure professional training and university curricula to include digital literacy and algorithm auditing. This capacity-building is imperative to equip notaries with the technical competency required to execute their transformed roles as digital gatekeepers, thereby minimizing professional negligence and protecting parties within the evolving digital legal ecosystem.

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