Application Of Digital Signing to Authentic Notarial Deeds In Changes To Electronic Contracts That Apply In Indonesia

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Abstract. Changes in technology and social procedures that have occurred, this is also the task of a notary who studies and prepares the procedures for recording the wishes of the parties that have developed into digitalization. Law and notaries as officials who record the wishes of the parties should follow the development of needs and procedures that develop in society, especially in the era of technology that is already digital. The role in an agreement that has changed towards digitalization will not be separated from the recording which then becomes binding for the parties as well as the problem of how the contents of the agreement are then stored by a notary. This study uses an empirical legal method, namely analyzing based on data sources in the field, namely notaries around North Sumatra, as well as regulations and other legal materials in order to draw a conclusion that can answer existing problems. The results of this study indicate that technological developments have resulted in changes to the procedures carried out by a notary. There are still many things that need to be prepared, especially in terms of how the parties can prove themselves for the electronic data created. This development also brings the government's need for a legal storage place or container so that authentic and valid notarial deeds can be made.

Keywords: Digital Signing, Authentic Notarial Deeds, And Electronic Contracts.

1 Introduction

The development of the world of technology has brought changes to the era of technology in the 5.0 era, which has had a huge impact on life. The development of communication media is increasingly advanced and can provide more effective and efficient services and functions in communicating. Among the media that can do this are computers, gadgets and other devices, now each of us can easily access the internet (Setiadewi, 2020). Since the enactment of Law Number 11 of 2008 concerning electronic information and transactions, slowly but surely buying and selling transactions have shifted from conventional to electronic based, hence the emergence of what is called e-com-

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merce. Not only that, in the line of government administration, especially public services, electronic-based services have also begun to be prioritized, so that e-Government has emerged. Opportunities and challenges in the era of globalization require notaries to not only be able to work manually, but also to be able to utilize technology-based information. It is undeniable that information technology and electronic transactions will be the spearhead of the era of globalization that is currently sweeping the world. Technological progress and development will ultimately change the organizational structure and social relations because the development of digital technology has resulted in integration or convergence in the development of information technology, media, and telecommunications (Setiadewi, 2020). This also triggers an increase that is tied between applications so that it cannot be changed by people who are not related to the existing data (Fran Casino et al., 2019).

In the context of public services, there is one type of non-government service, but it is very closely related to the implementation of public services and is closely related to regulations because its duties and functions are regulated by law, namely notary services. In article 1 paragraph (1) of Law Number 2 of 2014 concerning amendments to Law Number 30 of 2004 concerning the position of notary, it is stated that "a notary is a public official who is authorized to make authentic deeds and has other authorities as referred to in this law or based on other laws." (Edmon Makarim, 2013) So far, notary services to the public are still conventional, but along with its development which inevitably forces every part of life to migrate from a conventional system to an electronic system, notary services have also shifted towards electronic-based services, or what is known as cyber notary. The role of notaries is required to be able to follow the development of technology and information, because in electronic transactions it is very possible for notaries to intervene as a trusted third party, just like the role of notaries in conventional transactions. (Latumeten, 2006) It is very inappropriate if notaries still use conventional methods in providing services in the field of electronic transactions, because speed, punctuality and efficiency are very much needed by the parties. The development of the function and role of notaries in electronic transactions was then popularized with the term cyber notary. Changes in the procedures required by notaries then changed and required a binding and inviolable system (Haibo Yi, 2023). Notaries are required to be able and capable of using the concept of cyber notary in order to create fast, precise and efficient services, so as to accelerate the rate of economic growth. The idea of cyber notary emerged in 1995. However, the absence of a clear legal basis hampers the development of this business. Since the enactment of Law Number 11 of 2008 concerning electronic information and transactions, discussions regarding the concept of cyber notary have resurfaced. The authority of a notary in the field of cyber notary is expressly stated in the explanation of Article 15 paragraph (3) of Law Number 2 of 2014 concerning amendments to Law Number 30 of 2004 concerning the position of notary which reads "what is meant by "other authorities as regulated in laws and regulations" includes the authority to validate transactions carried out electronically (cyber notary), make deeds, mortgages, gifts, and aircraft mortgages." Based on the explanation of this article, a notary has the authority to validate transactions carried out through a cyber notary. The term certification comes from the English word 'certification' which means information, validation.

The digitalization method is the transformation of numbers, images, and others into binary parts (Anping Xiong et al., 2022; Xiaohua Wu et al., 2023). As a result, capital can be managed online through applications. Changes in procedures also appear, such as changes in manufacturing (Mira Burri & Kholofelo Kugler, 2024). One of the things that must be needed is the provision of software that supports technology development, so it is very necessary to prepare for technology that is not easily hacked (Tanya Golash-Boza et al., 2022). In the banking industry, there are online savings that can be done via internet banking or mobile banking, especially SMS banking. Mutual fund capital in various securities serves online businesses (Abramson SF, 2019), especially gold can be managed through online marketplaces. In addition, by using financial technology programs available on PC gadgets, investors via gadgets can function as capital providers (OuYang & Qiu, 2024; Zhihao Guo & Xiaoming Hu, 2024), not just official bank financial institutions. Peer to peer lending provides financial loans for MSMEs that do not have access to banking, equity crowdfunding raises funds in exchange for ownership, angel investors raise funds for business actors without compensation or even raise funds for the development of technology that converts data into digitalization and changes in permitted procedures (Lamplmair et al., 2023). Fintech facilitates business connections and reduces operational and capital budgets, making it attractive to capital owners. (Mary Lindemann, 2022; Ziboud Van Veldhoven et al., 2023) The certification carried out by the notary is hereinafter referred to as an authentic deed as stated in Article 1 paragraph (1) of Law Number 2 of 2014 as an amendment to Law Number 30 of 2004 which states that "a notary is a public official who is authorized to make authentic deeds and has other authorities as referred to in this law or based on other laws." then if we look at article 16 paragraph (1) letter m of law number 2 of 2014 concerning amendments to law number 30 of 2004 concerning the position of notary (Lumban Tobing, 1982). (Giuseppe De Luca & Marcella Lorenzini, 2024) Regarding the position of a notary, it is stated that in carrying out his/her position, a notary is required to read the deed in front of an audience attended by at least 2 (two) witnesses or 4 (four) witnesses specifically for making a will under hand and signed at that time by the presenter, witnesses and notary. Changes in data that make this development require trust and permission in order to develop in accordance with the procedures permitted by the market or users, namely notaries (Malvika Rao et al., 2019). Based on the existing problems, the requirement that arises is a physical meeting between the parties in front of a notary directly and face to face (R. van der Meyden, 2022). Meanwhile, in the concept of cyber notary, it is the opposite, that this physical meeting is not absolute (Jason Pratama Ong, 2021; Mira Burri & Kholofelo Kugler, 2024), because its function is replaced by telecommunication devices. This is where the legal conflict arises between conventional notary deed products and products in the form of electronic notary deeds or cyber notaries. This study aims to explore the procedures for making electronic or digital notarial deeds and valid signing based on the latest technology system.

2 Methods

2.1 Study Context

This research was carried out empirically, namely by analyzing problems in the field or daily life through an approach to legal principles, as well as referring to legal norms contained in applicable laws and regulations. Then data was collected on notaries who carry out notarial activities in the North Sumatra region, especially in the city of Medan, Binjai City, Deli Serdang Regency, Pematangsiantar City, and Simalungun Regency.

2.2 Data Procedure

This data was obtained from research conducted from 2022 to July 2024. This research collected data during the research process. This research stage interviewed related parties, namely eight notaries in the North Sumatra region, and adapted it to existing research materials. All information from this conversation was then summarized into a research analysis transcript.

2.3 Data Analysis

The data obtained through literature study and its sequence is then organized into one pattern. This data is analyzed qualitatively which will be described descriptively. Based on this research, the Mix Method method aims to interpret the analysis qualitatively and quantitatively and describe it in full of the main issues which are then used to reveal the truth and understand the truth.

3 Result And Discussion

3.1 The Process Of Making An Authentic Notarial Deed Which Is Valid Until Now In North Sumatra

Basically, this agreement has valid requirements so that it can be said to be a valid agreement. In civil law in Indonesia, civil law uses the basis of civil law in determining it, namely in Article 1320 of the Civil Code which reads; "in order for an agreement to be valid, four conditions are required: first, Those who bind themselves agree; second, Capacity to make an agreement; third, A certain thing; fourth, A lawful cause."

Before discussing further regarding the existing agreement, it is necessary to understand in more detail first regarding the true meaning of the four valid requirements for this agreement so that there are no errors in the process of making the contents of the agreement or deed.

In an agreement, there is an act of mutual offering (offerte) and accepting an offer (acceptatie) between the parties. The act of mutual offering and accepting the offer is called a mutually agreed statement of will (overeenstemende wilsverklaring), which then gives rise to a legal relationship. In a legal relationship there are reciprocal legal

rights and obligations between the parties. Several things that are the basis for the birth of an agreement, namely (Ghansham Anand, 2017):

First, born from freedom of will, second, born from a conscious mind, third, there is no misdirection or no error that can cause error, fourth, there is no coercion, fifth, there is no fraud or trickery (Jason Pratama Ong, 2021).

Freedom of will in relation to an agreement is the freedom to determine and give birth to the will or desire that will be stated in the agreement (André GAZSÓ et al., 2019). “Freedom of will” is related to “consciousness of thought”, namely awareness of the intent, purpose, responsibility, and risk in forming an agreement. Therefore, when drafting an agreement, the parties must be given an understanding of the intent, purpose, responsibility, and risk of the birth of the agreement and these things will apply from the time the agreement is signed. These understanding functions and plays a role in forming “freedom of will”, because the parties will know the complete picture before deciding to agree. A notary as a legal consultant is authorized to provide objective legal opinions to the parties regarding the matters to be agreed upon, including the legal provisions that regulate it, how it is regulated, and what the risks are. The legal opinion given by a notary is not a form of coercion of will but is a manifestation of the notary's duty to provide legal consultation for the parties. Notaries in providing legal opinions to and/or in drafting agreements for the benefit of the parties, must adhere to the "principle of providing legal consultation", namely, they must place themselves in a neutral position, may provide legal understanding but still place the parties as decision makers based on "free will" and "awareness of the minds of the parties themselves, with the attention of the notary there must be no mistakes or errors in understanding or applying the law. There are two types of legal agreements in drafting agreements, namely: (Nitasari, 2018) First, the Primary Agreement, is a first-level agreement that acts as the main or principal or core agreement. In the deed structure, the primary agreement is located on the premise of the deed. This primary agreement is the source of the obligation that gives rise to a legal relationship. Second, the Secondary Agreement is a second-level agreement that functions as a further regulation of the primary agreement. In the deed structure, the secondary agreement is located in the contents of the deed, namely in the articles and in the closing of the deed. Examples of legal agreements include (Rahmad Hendra, 2017): the first thing is. Establishment of a limited liability company, where there is a legal agreement, namely: a. The primary agreement is in the form of an agreement to establish a limited liability company. b. Secondary agreements are in the form of: 1) agreement on the selection and determination of the location of the company; 2) the term of the company; 3) the purpose and objectives and business activities; 4) provisions on capital and shares and their composition; 5) provisions on the General Meeting of Shareholders; 6) agreement on the division of positions of directors and commissioners along with their duties and authorities; 7) provisions on company administration regarding the work plan, financial year, annual report, use of profits and reserves, and distribution of dividends; 8) provisions on changes to the articles of association; 9) provisions on mergers, amalgamations, takeovers, and separations of companies; 10) provisions on the dissolution and liquidation of companies; 11) provisions on the legal domicile and procedures for resolving disputes or disagreements. Second, the agreement for the sale and purchase of land and buildings, which contains valid agreements,

namely: a. Primary agreement in the form of a sale and purchase agreement, a price agreement, and installment payments. b. Secondary agreements in the form of: 1) agreement on knowledge and acceptance of the existence and condition of the land (object of sale and purchase); 2) agreement on profits and losses suffered in connection with the land are the responsibility of the buyer, except for matters relating to the legality of land ownership which remain the responsibility of the seller; 3) agreement on the seller's guarantee for the land and the validity of proof of ownership; 4) agreement on the procedures and procedures for payment of installments for the sale and purchase along with provisions for sanctions for late payment; 5) provisions on the granting of power of attorney to sell by the seller to the buyer; 6) provisions on who bears the costs and taxes; 7) provisions regarding legal domicile and procedures for resolving disputes or disagreements.

Before understanding what an agreement between the parties made by a notary is, it is a good idea to first understand what is meant by a legal act (Nirmalapurie, 2022). Legal acts become an intermediary element because they play a role in connecting the main elements with the elements of intent and purpose, namely elements of certain legal objects or things that are certain or can be determined. The definition of a legal act is:

"Actions of a legal subject that are carried out intentionally, in order to control a certain legal object, the legal consequences of which are the birth of a legal relationship desired by the implementing legal subject or born for the sake of law."

Thus, the making of notarial deeds carried out in the North Sumatra region until now still uses the old production system and does not use electronic making.

3.2 The Role of The Notary In Proving If There Are Errors Made By The Parties In Proofing A Deed In The Digital Era

In principle, an agreement is a legal agreement between two or more legal subjects as parties to the agreement. However, in practice, it is possible for the parties to the agreement to attract other parties outside the agreement as parties who are drawn to obtain benefits. There can be 2 (two) groups of parties in the construction of an agreement, namely: 1. Bound parties, namely direct parties or parties who agree and together or participate in signing the agreement, in this case the parties carry out reciprocal legal acts; 2. Interested parties, namely indirect parties or parties who do not agree and do not participate in signing the agreement but are drawn as parties or persons appointed or parties who obtain or receive benefits from legal relations arising from unilateral legal acts. Interested parties consist of two subgroups, namely: a. Heirs based on general rights (onderalgemene titel) and/or parties who obtain rights from parties in the agreement based on special rights (onderbijzondere titel); b. Third parties who are drawn as parties or parties appointed or parties who obtain or receive benefits (Fani Martiawan Kumara Putra, 2020).

The Civil Code itself distinguishes 3 (three) groups of parties in an agreement, namely: First, the party who entered into the agreement itself, the legal basis of which is Article 1315 and Article 1340 of the Civil Code: Article 1315: "In general, no one can bind himself in his own name or ask for a promise to be made for himself." Article 1340: "An agreement only applies between the parties who made it". Second, the heirs

and those who receive rights from the parties who entered into the agreement, the legal basis of which is Article 1318 of the Civil Code: "If someone asks for something to be promised, then it is assumed that it is for his heirs and those who obtain rights from him, unless it is expressly stated or can be concluded from the nature of the agreement that this is not the case." Third, Third party, the legal basis is Article 1317 of the Civil Code: Paragraph (1): "In addition, it is also permissible to request the determination of a promise for the benefit of a third party, if it is the determination of a promise, made by a person for himself, or a gift given to another person, containing such a promise." Paragraph (2): "Anyone who has promised something like that, cannot withdraw it, if the third party has stated that he wants to use it." The four conditions in Article 1320 of the Civil Code are the basic principles of the agreement contained in Book III of the Civil Code. These four elements are the basis for other elements, namely the elements of legal acts and legal objects regulated in both Book II and Book III of the Civil Code. In the understanding of the agreement that has been constructed above, there is a relationship between the elements so as to form a complete understanding of the agreement. This understanding is still complemented by elements of substantive conditions, namely the elements of balance and justice, both of which are the principles of the agreement and finally the element of legal protection. The elements of balance and justice are two elements that complement each other. In everyday language, the word "balance" (evenwicht) refers to the meaning of "a state in which the distribution of burdens on both sides is balanced". In other words, it is understood as "a state of calm or harmony because of the various forces at work, none of which dominates the other, or because no single element dominates the other". The definition of balance according to (Wijanarko Fahma Rahman, 2015):

"A state of balance between two things or two different conditions that tend to be opposite so that they become balanced or equal or comparable." The element of balance is rooted in the "principle of balance", namely the principle that requires both parties to exercise their rights and obligations in a balanced manner. Balance is something taught by natural law. The balance taught by natural law is the balance between carrying out obligations and fulfilling rights. The means to measure whether something has fulfilled the balance is morality. Morality guides humans to maintain the balance of the laws that exist in the universe, maintaining a balance between carrying out obligations and fulfilling rights. If balance has been achieved, the initial result that will be obtained is the birth of the common good. Furthermore, the common good becomes the foundation for achieving justice. If justice has been achieved, happiness is the end result of a series of moral processes in creating balance and justice. Morality, balance, the common good and justice are formulas of natural law to achieve the ultimate goal of happiness. Morality, balance, the common good, and justice can be said to be the substance or elements of natural law, with the ultimate goal being the happiness of humanity.

The combination of balance and propriety outlined in the agreement is what makes the agreement fair.

In relation to the elements of legal protection in agreements, in general, protection itself has grammatical meanings as: 1. shelter; 2. things (actions and so on) that protect.

The parties who sign the notarial deed remotely consist of: First. a person or several people; and Second. a notary. This certainly raises the question of whether they are

regulated in the provision of digital signing as stipulated in the regulations on notary. The provision of digital signing has a slight difference, especially in terms of more proof compared to manual signing. Apart from proving the need for a more efficient system in order to protect and prove the existing signing (Ziheng Wang et al., 2024).

The person in question (Fani Martiawan Kumara Putra, 2020): "An individual, business entity, trust, trust, partnership, limited liability company, association, joint venture, state-owned enterprise, state-owned enterprise, or other legal entity or business entity".

Technology experts may have a different opinion because what should be considered more authentic is information from the aircraft's black box because the information is born from a system that is maintained and proven to be reliable and its historical data can be traced. This can be explained technically from the installation report until it is found again at some point after the accident. For technology people, it would certainly sound a bit naive to see authenticity only in terms of formality by entrusting the authenticity of the material entirely to public officials who carry out their duties under oath, while there is no other information that can explain or prove that the official concerned in making the deed has carried out all the formalities as it should. In addition, in current practice, many fake deeds are found because the media materials used are relatively easy to duplicate. This question should be self-criticism of the notary, whether he has really fulfilled all the established procedures and how he can prove it if he does not have other electronic information that can explain it, without having to rely on just one legal assumption. Meanwhile, at the middle level, the existence of IE can fulfill one of the five elements in secure communication but is still open to the presence of the person concerned. Objectively, IE guarantees its validity or can explain who the Legal Subject is responsible for, but the accountability or reliability of the Electronic System used is not guaranteed to run properly (not accredited) so that it can be easily rejected by the person concerned. While at the strongest level (high level), the existence of IE objectively guarantees its validity and can explain who the legal subject is responsible for and the electronic system is guaranteed to run well (accredited) so that as long as it cannot be proven otherwise by the parties, then what the system states can be considered technically and legally valid. In this context, the substance of an IE has been well maintained and can be materially equated with an authentic deed.

3.3 Application Of Digital Signing to Authentic Notarial Deeds In Changes To Electronic Contracts That Apply In Indonesia

The use of sentences that describe the presence of the presenter before the notary throughout the process of reading the deed until the signing of the deed, in notarial practice there are many variations, namely (Nirmalapurie, 2022): first, facing me, notary; second, facing me, notary; third, facing me, notary.

In addition, various applications are also being developed to store and compare the characteristics of a person's signature, including by recording pen pressure and the length of the signing process. The data is then stored as an algorithm that will be used for comparison against future signatures. In general, reliability testing as stipulated in the UNCITRAL Model Law and ECC can be used for the use of biometric technology so that it can be legally recognized.

Meanwhile, something that is very vulnerable and very likely to happen is when state administrators require the submission of biometric data from their citizens (for example: KTP, SIM, and Immigration) but on the other hand also allow other parties to access it, especially the private sector, to cooperate with the government in carrying out affairs for the community. This should be done firmly and with a high degree of caution (COLLOMB A et al., 2019). And currently legal protection is of course given by threatening punishment to parties who unlawfully access, obtain, transfer, or disclose confidential information to the public improperly. Article 406.101 number 4 of the Texas Government Code, 2018 states the meaning of an electronic notarial deed.

The essence of an electronic notarial deed is a certificate. An electronic notarial deed is part of an electronic document made by a remote notary. The proof of this deed must prove the events and processes that occur that do not eliminate the procedures that should be carried out in the deed (R. van der Meyden, 2022). The creation of this procedure should not then replace the creation of documents into electronics so that it is like the general rules in standard electronic documents (Cherise Valles et al., 2019).

An electronic notarial deed is an electronic document. Electronic documents or what is meant by electronic documents (Nawaaf Abdullah, 2017), Information that is created, produced, sent, communicated, received, or stored electronically.

The essence of electronic documents is information, namely information that is: created; produced; sent; communicated; received; or stored electronically.

A remote notary is a notary who is authorized to make and sign deeds using communication technology (Qingyong Deng et al., 2024; Shiyu Shen et al., 2024). This is necessary to maintain the trust and confidence of users so that they dare to make this deed.

From the description above, the definition of a remote notarial deed can be stated. A remote notarial deed is (Syifa Aisyah, 2021):

"A statement made in advance and before a remote notary through communication technology containing the title of the deed, the place where it was made, the contents of the deed, the notary's signature, and the stamp."

There are four things listed in the definition above, namely (Mohamat Riza Kuswanto, 2017): First, the essence; Second, the official who signs it; Third, how to sign it; and fourth, the structure of the deed.

The essence of a deed is a statement or information. Officials who make and sign a remote notarial deed are: First, a remote notary; Second, the parties; and third, witnesses. The signing method uses communication technology (Santa Slokenberga, 2022). The structure of an authentic notarial deed digitally, namely the form of the deed, should have been stated in the notarial regulations wherever the country is, as well as permission for the signing and formation of the deed to the storage of the deed in electronic form so that it can be called an electronic notarial deed (Yanni Yang et al., 2024). So that at the time of making this deed, it is also supported by a chain basis that is bound by a good administrative system so as to reduce the impact of bad faith such as when signing or proving the parties with electronic-based identification cards (Batu Kinikoglu, 2023). So the basis for the existence of an electronic notarial deed is to make it easier for notaries to provide services to the parties and its reach is wider. And with this wider reach, it can reach both parties so that it can be included in the deed that

better guarantees the position of the parties' agreement. With good data recording, problems will be minimized in the future, so that disputes become more structured, which minimizes deliberate obstacles that can be detrimental.

4 Conclusion

The thing that makes many notaries in North Sumatra not make deeds online is that many notaries cannot keep up with technological developments because many notaries in North Sumatra are quite old. In addition, there is no clear permit and regulation that provides a clear application or method for signing and storing deeds digitally in laws and regulations regarding authentic deeds, especially authentic notarial deeds. In carrying out their duties, notaries in proving mistakes made by parties with proof of deeds in the current digital era with several systems can include storing evidence of how the transaction was recorded and the need for additional equipment that can prove the validity of the parties such as data at the civil registration agency that can be accessed with an electronic KTP to prove themselves. Additional equipment and systems are needed to be able to make deeds electronically for parties who make deeds online. Changes in procedures and systems are needed that can bind the government system and clear rules in order to reduce the impact of fraud and data leakage to unauthorized parties. Therefore, the signing system cannot only be carried out with a digital signature, but also requires some digital supporting data to prove the truth of the parties' data.

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References

1. Abramson SF, B. C. (2019). Endogenous Parliaments: The Domestic and International Roots of Long-Term Economic Growth and Executive Constraints in Europe. *International Organization*, *73*(4), 793–837.
2. André GAZSÓ, Gloria Elisabeth ROSE, Anna PAVLICEK, & Sabine GRESSLER. (2019). Regulating Nanotechnological Applications for Food Contact Materials. *European Journal of Risk Regulation*, *10*(1). https://doi.org/https://doi.org/10.1017/err.2019.9
3. Anping Xiong, Guihua Liu, Qingyi Zhu, Ankui Jing, & Seng W. Loke. (2022). A notary group-based cross-chain mechanism. *Digital Communications and Networks*, *8*(6). https://www.sciencedirect.com/science/article/pii/S235286482200061X/pdfft?md5=88f3199cd7fccc68f506008777d1c3c2&pid=1-s2.0-S235286482200061X-main.pdf
4. Batu Kinikoglu. (2023). Implementing a new data protection law: lessons from the Turkish experience. *International Data Privacy Law*, *13*(1). https://doi.org/https://doi.org/10.1093/idpl/ipad001
5. Cherise Valles, Vitaliy Pogoretskyy, & Tatiana Yanguas. (2019). Challenging Unwritten Measures in the World Trade Organization: The Need for Clear Legal Standards . *Journal of International Economic Law*, *22*(3), 459–482. https://doi.org/https://doi.org/10.1093/jiel/jgz007

6. COLLOMB A, DE FILIPPI P, & SOK K. (2019). Blockchain Technology and Financial Regulation: A Risk-Based Approach to the Regulation of ICOs. *European Journal of Risk Regulation*, *10*(2). https://doi.org/https://doi.org/10.1017/err.2019.41
7. Fani Martiawan Kumara Putra. (2020). Characteristic of Notary Deeds for Transactions Through Electronic Media. Norma, 17(3). 10.30742/nlj.v17i3.1091
8. Fran Casino, Thomas K. Dasaklis, & Constantinos Patsakis. (2019). A systematic literature review of blockchain-based applications: Current status, classification and open issues. *Telematics and Informatics*, *36*, 55–81. https://www.sciencedirect.com/science/article/pii/S0736585318306324/pdfft?md5=35cf42382c75f2eb32832e4739e87ad8&pid=1-s2.0-S0736585318306324-main.pdf
9. Ghansham Anand. (2017). Keabsahan Akta Notaris Kaitannya Dengan Kewajiban Pembubuhan Sidak Jari Penghadap. Lambung Mangkurat Law Journal, 2(1). https://doi.org/https://doi.org/10.32801/lamlaj.v2i1.30
10. Giuseppe De Luca, & Marcella Lorenzini. (2024). Notary Lending Networks in Northern Italy in the Eighteenth and Nineteenth Centuries. *Credit Networks in The Preindustrial World*. https://doi.org/https://doi.org/10.1007/978-3-031-67117-3_11
11. Haibo Yi. (2023). A post-quantum blockchain notary scheme for cross-blockchain exchange. *Computers and Electrical Engineering*, *110*. https://www.sciencedirect.com/getaccess/pii/S0045790623002562/purchase
12. Jason Pratama Ong. (2021). THE ENFORCEABILITY OF DIGITAL CONTRACT: A COMPARATIVE ANALYSIS ON INDONESIA AND NEW ZEALAND LAW. *The Lawpreneurship Journal*, *1*(1). https://doi.org/https://doi.org/10.21632/tlj.1.1.30-42.
13. Lamplmair, P., Pfeifhofer, S., & Berger, B. (2023). Data Notary—Auditable Data as a Basis for Monetization. *The Monetization of Technical Data*. https://link.springer.com/chapter/10.1007/978-3-662-66509-1_12#citeas
14. Lumban Tobing, G. (1982). Peraturan Jabatan Notaris. Erlangga.
15. Makarim. (2013). Notaris dan Transaksi Elektronik, Kajian Hukum tentang Cybernotary atau Electronic Notary. Rajawali Pers.
16. Malvika Rao, GeorgJ P Link, Don Marti, Andy Leak, & Rich Bodo. (2019). A market for trading software issues. *Journal of Cybersecurity*, *5*(1). https://doi.org/https://doi.org/10.1093/cybsec/tyaa016
17. Mary Lindemann. (2022). A Dutch Notary and His Clients. *Historicizing Life-Writing and Egodocuments in Early Modern Europe*. https://link.springer.com/chapter/10.1007/978-3-030-82483-9_11#citeas
18. Mira Burri, & Kholofelo Kugler. (2024). Regulatory autonomy in digital trade agreements. *Ournal of International Economic Law*, *27*(3). https://doi.org/https://doi.org/10.1093/jiel/jgae025
19. Mohamat Riza Kuswanto, H. P. (2017). Urgensi Penyimpanan Protokol Notaris Dalam Bentuk Elektronik Dan Kepastian Hukumnya Di Indonesia. REPERTORIUM, 4(2). https://jurnal.uns.ac.id/repertorium/article/view/18280
20. Nawaaf Abdullah. (2017). Kedudukan Dan Kewenangan Notaris Dalam Membuat Akta Otentik. Jurnal Akta, 4(4). https://doi.org/http://dx.doi.org/10.30659/akta.v4i4.2508
21. Nirmalapurie, N. A. , & F. X. A. (2022). The Use of Electronic Signatures and Seals in Notarial Deeds According to the Principle of Tablelionis Officium Fideliter Exercebo. LEGAL BRIEF, 11(3). https://legal.isha.or.id/index.php/legal/article/view/28

22. Nitasari, K. R. (2018). Akibat Hukum Dari Perjanjian Kredit Bank Yang Tidak Dilegalisasi Oleh Notaris. Kertha Semaya : Journal Ilmu Hukum, 2(4). https://ojs.unud.ac.id/index.php/kerthasemaya/article/view/38341
23. OuYang, C., & Qiu, X. (2024). Cross-Chain Model of Notary Group Based on Verifiable Random Functions. *Mobile Networks and Management*, *559*. https://link.springer.com/chapter/10.1007/978-3-031-55471-1_4
24. Qingyong Deng, Qinghua Zuo, Zhetao Li, Haolin Liu, & Yong Xie. (2024). Blockchain-Based Reputation Privacy Preserving for Quality-Aware Worker Recruitment Scheme in MCS. *IEEE/ACM Transactions on Networking*. https://doi.org/10.1109/TNET.2024.3453056
25. R. van der Meyden. (2022). A Formal Treatment of Contract Signature. *IEEE Transactions on Services Computing*, *15*(6), 3101–3114. https://doi.org/10.1109/TSC.2021.3101833
26. Rahmad Hendra. (2017). Tanggungjawab Notaris Terhadap Akta Otentik Yang Penghadapnya Mempergunakan Identitas Palsu Di Kota Pekanbaru. Jurnal Ilmu Hukum, 3(1). https://doi.org/https://doi.org/10.23887/jkh.v6i1.23446
27. Santa Slokenberga. (2022). Biobanking and data transfer between the EU and Cape Verde, Mauritius, Morocco, Senegal, and Tunisia: adequacy considerations and Convention 108. *International Data Privacy Law*, *10*(2). https://doi.org/https://doi.org/10.1093/idpl/ipaa006
28. Setiadewi, K. , & H. W. I. M. (2020). Legalitas Akta Notaris Berbasis Cyber Notary Sebagai Akta Otentik. Jurnal Komunikasi Hukum (JKH), 6(1), 126–134.
29. Shiyu Shen, Hao Yang, Wangchen Dai, Hong Zhang, Zhe Liu, & Yunlei Zhao. (2024). High-Throughput GPU Implementation of Dilithium Post-Quantum Digital Signature. *IEEE Transactions on Parallel and Distributed Systems*, *35*. https://doi.org/10.1109/TPDS.2024.3453289 Authors
30. Syifa Aisyah. (2021). Akibat Hukum Terhadap Akta Notaris Yang Tidak Sesuai Dengan Fakta Hukum. REPERTORIUM: JURNAL ILMIAH HUKUM KENOTARIATAN, 10(2). https://doi.org/http://dx.doi.org/10.28946/rpt.v10i2.1439
31. Tanya Golash-Boza, Hyunsu Oh, & Carmen Salazar. (2022). Broken windows and order-maintenance policing in gentrifying Washington, DC. *Policing and Society*, *33*(2). https://doi.org/https://doi.org/10.1080/10439463.2022.2085268
32. Xiaohua Wu, Tingbo Zhang, Jing Wang, Jun Cheng, & Zirui Wang. (2023). A distributed cross-chain mechanism based on notary schemes and group signatures. *Journal of King Saud University - Computer and Information Sciences*, *35*(10). https://www.sciencedirect.com/science/article/pii/S1319157823004160/pdfft?md5=18eb78a8e4febd9553caecb978d6b7a0&pid=1-s2.0-S1319157823004160-main.pdf
33. Wijanarko Fahma Rahman. (2015). injauan Yuridis Akta Notaris Terhadap Pemberlakuan Cyber Notary Di Indonesia Menurut Undang-Undang Nomor 2 Tahun 2004. Jurnal Repertorium, 2(2). https://interoperabilitas.perpusnas.go.id/record/detail/1301107/tinjauan-yuridis-akta-notaris-terhadap-pemberlakuan-cyber-notary-di-indonesia-menurut-undang-undang-nomor-2-tahun-2014
34. Yanni Yang, Pengfei Hu, Jun Luo, Zhenlin An, Jiannong Cao, Dongxiao Yu, & Xiuzhen Cheng. (2024). Romeo: Fault Detection of Rotating Machinery Via Fine-Grained Mmwave Velocity Signature. *IEEE Transactions on Mobile Computing*. https://doi.org/10.1109/TMC.2024.3463955
35. Zhihao Guo, & Xiaoming Hu. (2024). Calculation and selection scheme of node reputation values for notary mechanism in cross-chain. *The Journal of Supercomputing*, *80*. https://link.springer.com/article/10.1007/s11227-024-06152-3#citeas

36. Ziboud Van Veldhoven, Kani Kiliç, Divya Prakash, Ryan Michael Smith-Cooper, & Jan Vanthienen. (2023). How a Professional Association Can Steer Digital Transformation: Case Study of the Belgian Notary Industry. *Communications in Computer and Information Science*, *1871*. https://link.springer.com/chapter/10.1007/978-3-031-43703-8_12#citeas
37. Ziheng Wang, Xiaoshe Dong, Heng Chen, Yan Kang, & Qiang Wang. (2024). CUSPX: Efficient GPU Implementations of Post-Quantum Signature SPHINCS+. *IEEE Transactions on Computers*, *1*. https://doi.org/10.1109/TC.2024.3457736