

## Validity of Electronic Signatures in Digital Agreements: An Analysis of the Application of the Intellectual Property Law and the Civil Code in E-Commerce Transactions

\*Muhammad Rizky Aji Perdana<sup>1</sup>, Rizki Tri Anugrah Bhakti<sup>2</sup>, Dwi Afni Maileni<sup>3</sup>, Indra Sakti<sup>4</sup>,  
<sup>1,2,3,4</sup> Universitas Riau Kepulauan, Indonesia  
 \*rizki.tri.ab@gmail.com

Received: 18-12-2025

Revised: 25-12-2025

Accepted: 30-12-2025

### Abstract

The development of e-commerce encourages the increasing use of digital agreements that rely on electronic signatures as a tool to ratify agreements between the parties. The main problem that arises is the weak legal certainty related to the validity of electronic signatures, especially in the context of proving digital transaction disputes, even though it has been normatively recognized in the Civil Code and the Electronic Information and Transaction Law (UU ITE). This study aims to analyze the validity of electronic signatures in digital agreements in e-commerce transactions in Indonesia and assess the extent to which existing legal arrangements are able to provide legal certainty. This research uses a qualitative method with a type of normative legal research through a legislative approach and a conceptual approach. The data source consists of primary legal materials in the form of laws and regulations, as well as secondary legal materials in the form of legal literature, journal articles, and previous research collected through literature studies. The results of the study show that electronic signatures have legal force as long as they meet the requirements of the agreement according to Article 1320 of the Civil Code and the provisions of the ITE Law, but in practice they still face obstacles to proof, the reliability of electronic systems, and low digital legal literacy. Therefore, this study recommends strengthening technical regulations, increasing the role of certification bodies, and increasing digital legal literacy to ensure legal certainty and protection of parties in e-commerce transactions.

**Keywords: Digital Signature, Electronic Contract, Legal Validity.**



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### INTRODUCTION

Advances in information technology and telecommunications have encouraged the development of various services Telecommunications and technology products that integrate various information media. Computers, as human aids, allow easy access to public networks, thus facilitating the transfer of data and information with increasing capacity and capabilities (Saputra et al. 2023). In recent years, the e-commerce industry has experienced significant growth. The development of e-commerce has become a crucial component in the Indonesian economy, showing its growing strength and influence in the domestic market (Faisal and Fasa 2025). The development of information technology has brought significant changes in various aspects of life, including civil law, especially in the contractual realm. Electronic contracts emerged as an innovation that allows agreements to be carried out without being bound by time and space, becoming an efficient solution in the digital age. However, its existence poses juridical challenges related to proof, because traditional civil law is still based on physical written contracts (Wibowo et al. 2024).

Advances in information technology have changed various aspects of life, including commerce. Electronic commerce (e-commerce) allows buying and selling transactions to be carried out online, opening up wider and more efficient business opportunities. Although practical, online transactions pose legal challenges related to the validity of agreements. According to Article 1320 of the Civil Code, the legal conditions of the agreement include agreements, skills, certain objects, and *causa* that are *halal*. Fulfilling this requirement becomes more complex in online transactions because there are no physical meetings and the use of electronic signatures (Harto et al. 2023). The development of e-commerce in Indonesia began in 1999 with the presence of platforms such as Kaskus and Bhinneka.com. The widespread penetration of the internet has shifted transactions from conventional to digital. APJII data shows that 78.19% of Indonesia's total population are active internet users, showing the great potential of the digital market as well as challenges related to regulation and security of online transactions (Chang, Frederica, and Khairunisa 2024).

Article 1320 of the Civil Code stipulates the legal conditions of the agreement: agreement, competence, certain objects, and *causa* that are *halal*, which also apply to electronic contracts. The main problem arises in proving in court, so digital signatures and electronic evidence are crucial aspects. Law No. 11 of 2008 jo. Law No. 19 of 2016 recognizes electronic documents and signatures as valid evidence, affirming the legal force of electronic contracts equivalent to conventional contracts. The reliability of the technology and the authentication mechanism of the parties are the determining factors of validity, since electronic contracts without certification are difficult to prove in court (Widyawati, Legowo, and Purnomo 2025).

In the practice of e-commerce transactions in Indonesia, the issue of the validity of electronic signatures has given rise to various legal disputes that show that there is a gap between normative regulation and implementation in the field. A number of civil cases involving electronic contracts show that digital documents and electronic signatures are often questioned for their evidentiary strength in court, especially when they are not supported by electronic certificates from trusted providers. This condition is exacerbated by the low digital legal literacy of business actors and consumers, especially MSMEs, who still use online approval mechanisms without an adequate authentication system. Although the ITE Law explicitly recognizes electronic signatures as legal evidence, in practice there are still doubts among law enforcement officials in assessing the reliability of the electronic systems used. The weak validity of electronic signatures not only has an impact on the uncertainty of contractual law, but also has social implications in the form of declining public trust in digital transactions and increasing potential consumer losses due to the difficulty of enforcing legal rights.

Although legally recognized, the practice of electronic contracts still faces obstacles. Many judges still assess evidence based on the physical contract paradigm, while business actors, especially MSMEs, have low legal digital literacy. This has an impact on the weak validity of online agreements and the high risk of contracts that do not meet security and legality standards (Saputran and Wardan 2025). Electronic contracts are agreements that have emerged along with technological advancements, allowing buying and selling transactions to be carried out digitally. Because regulations related to legal requirements and legal force are not yet clear, clear provisions are needed, especially to protect consumers from unilaterally made standard

clauses. The legal force of electronic contracts is determined by the fulfillment of the conditions regulated by law, not just the form of documents. Transactions can be made without physical meetings, utilizing computer networks and the internet, making electronic contracts an important instrument in modern commerce. Legally, electronic contracts realize the principle of freedom of contract (Article 1338 of the Civil Code) and their validity must be in accordance with the legal requirements of the agreement of Article 1320 of the Civil Code, including agreements, skills, certain objects, and *causa* that are *halal* (Tarigan and Sawitri 2025).

Signatures act as a means of identification and endorsement in documents, as well as written evidence of agreements in business and transactions. In the digital age, electronic signatures make the agreement process easier and more efficient, while providing security, authentication, and legal proof. Its types, including digital signatures, have been legally regulated and have legal force equivalent to conventional signatures, thus supporting digital transformation in various sectors, especially business and transactions (Tambunan and Triana 2025).

Although electronic transactions are growing rapidly, security and legality issues remain major challenges, especially regarding the validity of agreements and the protection of personal data. Digital signatures emerged as a solution to ensure the security of online transactions, supported by Law No. 11 of 2008 concerning Information and Electronic Transactions which was revised through Law No. 19 of 2016. However, technical obstacles, standardization of procedures, and harmonization of regulations with international standards still need to be overcome. Juridical studies of digital signatures are important to support the development of regulations that are adaptive to the complexity of electronic transactions and cybersecurity threats (Susilowati, Muhtarom, and Junaidi 2025).

Various previous studies have examined the validity of electronic contracts and electronic signatures in e-commerce transactions from the perspective of civil law and digital regulation. Research by Widyawati et al. (2025) emphasizes that click-based digital agreements and electronic signatures are basically valid as long as they meet the requirements of Article 1320 of the Civil Code, but still face evidentiary problems due to the paradigm difference between electronic documents and physical documents in judicial practice. Furthermore, Susilowati et al. (2025) show that although the ITE Law has provided legal recognition for electronic signatures, the absence of technical standards that are equally understood by law enforcement officials leads to weak legal certainty in e-commerce dispute resolution. Tambunan and Triana's research (2025) emphasizes the importance of using certified electronic signatures to strengthen the evidentiary power of digital contracts, especially in online lending and borrowing agreements, but has not yet linked it deeply to the conflict of norms between the ITE Law and the Civil Code. Meanwhile, Sopiani et al. (2024) examined the implications of non-fulfillment of subjective conditions of agreements on the validity of contracts, but still focused on conventional agreements and have not specifically examined the characteristics of electronic proof. Based on this study, it can be concluded that previous research still tends to be normative-descriptive, so a study is needed that integrates legal analysis of agreements, electronic proof, and the principle of legal certainty in the context of e-commerce transaction practices in Indonesia.

Various previous studies have generally placed the validity of electronic signatures in a normative framework by affirming their conformity with Article 1320 of the Civil Code and the provisions of the ITE Law, but have not in-depth examined the tension between the normative recognition and the reality of its application in proving e-commerce disputes. Most studies are still descriptive-regulative and focus on the repetition of positive legal norms, without critically reviewing aspects of the reliability of electronic systems, the role of certification bodies, and their practical implications in judicial practice. The research gap lies in the lack of studies that integrate classical civil law analysis with the dynamics of electronic evidence in the context of modern digital transactions. Therefore, the novelty element of this research lies in the effort to examine the validity of electronic signatures not only as the fulfillment of formal treaty requirements, but also as an instrument of legal proof that faces technical, institutional, and cultural challenges in the Indonesian legal system.

Departing from the empirical phenomenon and the emptiness of the study, the formulation of the problem in this study is directed to answer how the validity of electronic signatures in digital agreements is considered valid according to the ITE Law and the Civil Code in the context of e-commerce transactions in Indonesia, as well as the extent to which these regulations are able to guarantee legal certainty in practice. The formulation of this problem is systematically prepared to bridge the gap between normative regulation and juridical implementation in the field, especially in terms of proving electronic contracts. Based on this description and looking at the phenomenon that often occurs in society, the author is interested in further examining the problems related to how the validity of electronic signatures in Digital agreements is considered valid according to the ITE Law and the Civil Code in e-commerce transactions in Indonesia

## **RESEARCH METHODS**

This research is included in the category of normative legal research conducted with a qualitative method, because the focus of the study is to examine legal norms, legal principles, and legal doctrines related to the validity of electronic signatures in digital agreements in e-commerce transactions. Normative legal research in this study is not limited to tracing the norms of laws and regulations alone, but is directed to find legal truth through normative juridical logic as stated by Jonny Ibrahim, namely by building legal arguments based on legal disciplines and work methodologies that apply in normative law studies. This approach was chosen because the problems studied require an analysis of the consistency of norms, legal certainty, and the juridical implications of the application of electronic signatures in the practice of digital transactions.

The research approaches used include a statutory approach and a conceptual approach. The legislative approach is applied to systematically review the provisions in the Civil Code, Law No. 11 of 2008 concerning Electronic Information and Transactions as amended by Law No. 19 of 2016, as well as implementing regulations that regulate electronic signatures and the implementation of electronic systems. Meanwhile, a conceptual approach is used to examine the principles of freedom of contract, the legal terms of agreements, the principle of legal certainty, and the concept of proof in civil law relevant to electronic transactions. The

combination of these two approaches allows for a comprehensive analysis between written norms and legal conceptual constructions.

The object of research in this study is the legal regulation and normative practices related to electronic signatures in digital agreements, so this study does not determine the subject or location of field research. The research focuses on the Indonesian national legal context by considering the dynamics of e-commerce transactions that have developed in recent years. The time span of the study was conducted during the process of collecting, classifying, and analyzing relevant legal materials, to ensure that the norms and practices analyzed reflect the actual conditions of the implementation of electronic signatures.

The data sources in this study consist of primary legal materials, secondary legal materials, and non-legal materials. Primary legal materials include laws and regulations that are the main basis for analysis, especially the Civil Code, the ITE Law and its implementing regulations. Secondary legal materials are used as a complement to the analysis, including legal textbooks, national and international scientific journal articles, previous research results, and relevant academic publications. The non-legal materials in the form of news and institutional reports are used to strengthen the empirical context and illustrate the application of legal norms. Data collection techniques are carried out through library research and information search through credible online media.

Data analysis is carried out qualitatively with normative-argumentative analysis techniques, namely by systematically examining legal materials, relating between norms, and assessing the adequacy and consistency of legal arrangements for the problems being studied. The collected legal materials are analyzed through legal interpretation and juridical reasoning to draw conclusions regarding the validity of electronic signatures in digital agreements. The results of the analysis are then compiled in a descriptive-analytical manner to answer the problem formulation and achieve the research objectives comprehensively.

## RESULTS AND DISCUSSION

### Normative Mapping of the Validity of Electronic Signatures in Digital Agreements

To provide a systematic picture of the validity of electronic signatures in digital agreements, it is necessary to map the legal norms that govern the aspects of the validity of agreements and the evidentiary power of electronic documents. This mapping aims to show the relationship between the provisions of the Civil Code as a general civil law and the ITE Law as a special regulation that regulates electronic transactions.

Table 1. Comparison of the Regulation of the Validity of Agreements in the Civil Code and the ITE Law

Aspects	Civil Code	UU ITE
Basis of Validity of the Agreement	Article 1320 of the Civil Code (agreement, prowess, certain objects, causa halal)	Not setting out legal terms in detail, but acknowledging electronic agreements
Form of Agreement	Generally written physically or verbally	Agreements can be made electronically

Evidence	Authentic deeds and deeds under hand	Electronic documents and electronic information as legal evidence
Signature	Wet signatures	Electronic signatures that meet the requirements of Article 11 of the ITE Law

This table shows that the Civil Code functions as the general basis for the validity of agreements, while the ITE Law expands the form and medium of agreements to the electronic realm. However, the ITE Law does not re-detail the legal requirements of the agreement as the Civil Code, so the validity of electronic contracts still depends on Article 1320 of the Civil Code. This condition confirms that electronic signatures are not a substitute for the legal terms of the agreement, but rather an authentication instrument that strengthens the proof of agreement in digital contracts.

In the practice of e-commerce, electronic signatures are a crucial element to prove the consent of the parties. However, not all electronic signatures have the same legal force. Therefore, it is necessary to map the validity criteria for electronic signatures as stipulated in the ITE Law and its implementing regulations.

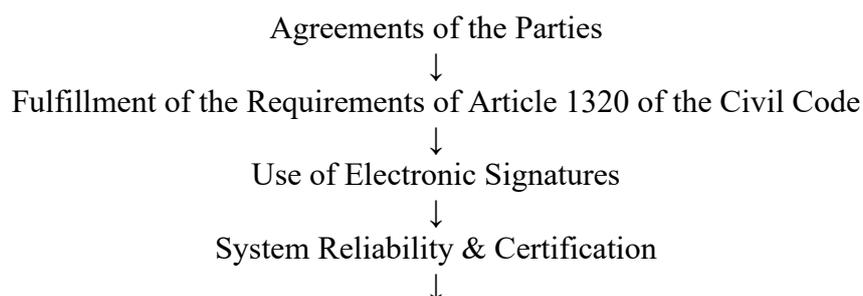
Table 2. Validity Criteria for Electronic Signatures

Criteria	Normative Explanation
Identify the Signer	Can identify the legal subject who signed
Consent of the Parties	Showing the existence of a will and agreement
Document Integrity	Guarantee no changes after signing
Reliability of Electronic Systems	Using a safe and reliable electronic system
Electronic Certification	Supported by an electronic certification provider (if certified)

This table shows that the validity of electronic signatures is not only determined by their digital form, but also by the fulfillment of the elements of authentication, integrity, and reliability of the system. Electronic signatures that do not meet these criteria have the potential to be weak in proof in court. Therefore, the use of certified electronic signatures is an important factor in increasing the legal certainty of e-commerce transactions.

### E-Signature Validity Scheme in E-Commerce Transactions

To clarify the flow of assessing the validity of electronic signatures, the following is presented a conceptual scheme that describes the stages of digital agreement validity in e-commerce transactions.



## Validity of Digital Agreements



### Evidentiary Power in Court

This chart shows that the validity of an electronic signature does not stand alone, but rather is part of a set of agreement validity. The agreement of the parties and the fulfillment of the requirements of Article 1320 of the Civil Code are the main foundations, while electronic signatures function as a means of authentication that strengthens proof. The reliability of the electronic system and the existence of certification are the main determinants of whether or not an electronic contract is accepted as valid evidence in the judicial process.

Normative data mapping through these tables and schemas shows that although normatively electronic signatures have been recognized as legitimate, their implementation still faces technical and institutional challenges. The non-fulfillment of the system reliability criteria or the absence of electronic certification can weaken the legal position of the parties in an e-commerce dispute. Therefore, this visualization emphasizes the urgency of strengthening technical regulations, increasing the use of certified electronic signatures, and increasing digital legal literacy to ensure that the validity of electronic signatures is not only recognized normatively, but also effective in practice.

### **The Validity of Electronic Hands in Digital Agreements is Considered Valid According to the ITE Law and the Civil Code in E-Commerce Transactions in Indonesia**

Technological developments have encouraged the increasing need for digital services that offer convenience in various activities. The internet, which initially functioned as a source of information, has now developed into a multifunctional means. This transformation has also penetrated the economic sector, where trade activities that previously took place in a conventional manner are now shifting to the digital space through various online platforms (Fauzi et al. 2023).

E-commerce provides benefits in marketing efficiency, time, and cost. However, the absence of a physical meeting between the parties increases the potential for errors and fraud, especially those that are detrimental to consumers, for example the mismatch of goods with the offer. On the other hand, the development of digital businesses has not been fully balanced by the existing legal system. In cross-border transactions, the different legal systems require regulatory harmonization to ensure legal certainty in international electronic commerce (Suryadi 2025).

E-Commerce (electronic commerce) is a transaction of buying and selling products, services and information between business partners through a computer network, namely the internet. The Internet is a "global network of computer networks" or a very large network of computers formed from small networks around the world that are interconnected with each other. One of the functions of the internet is as the main infrastructure of E-Commerce (Hasanudin 2021).

According to Julian Ding as quoted by Mariam Darus Badrulzaman, he gave a definition, namely: *"Electronic Commerce, or E-Commerce as it is also known is a commercial transaction between a vendor and purchaser or parties in similar contractual relationships for*

*the supply of goods, services or the acquisition of "right". This commercial transaction is executed or entered into an electronic medium (or digital medium) when the physical presence of the parties is not required. And the medium exists in a public network or system as opposed to a private network (Closed System). The public network or system must be considered an open system (e.g the internet or the world wide web), the transactions are concluded regardless of national boundaries or local requirements". (Skeleton n.d.)*

Free translation is a commercial transaction between a seller and a buyer to provide goods, services or take over rights. This contract is carried out with electronic media (digital medium) where the parties are not physically present and this medium is contained in a public network with an open system, namely the internet or world wide web. These transactions occur regardless of regional boundaries and national requirements.

With the development of technology, the laws that govern must also follow the dynamics of technological developments, including in the development of E-Commerce. The ITE Law is the legal basis that is the basis for electronic transaction activities, Article 1 number 2 of the ITE Law states that electronic transactions are legal acts carried out using computers, computer networks, and/or other electronic media. This provision explains the scope of E-Commerce which is also a legal act that has a clear legal basis (Vebriani and Danyathi 2025).

The Legal Basis of E-Commerce is as follows:

- a. Civil Code In a general view, a sale and purchase transaction is a type of agreement regulated in book III of the Civil Code (Civil Code), this agreement is one of the real agreements meaning that this agreement only occurs when the goods that are the subject of the agreement have been handed over. Electronic transactions, which are also a buying and selling transaction, of course in the process there is an agreement. E-Commerce agreements made by the parties are not like agreements in general, but the agreement can be made, even without a direct meeting between the two parties, but the agreement between the parties is carried out electronically. Electronic transactions can be outlined in an electronic contract, so the contract is binding on the parties.
- b. Law No. 19 of 2016 concerning Information and Electronic Transactions Legal issues on the internet that have not been clearly covered by the law include nline contracts, privacy, E-Commerce, electronic payments, the responsibility of homepage creators, e-mail, and chat. In the event that the contract is performed in cyberspace, the regulations have no difference. However, there are completely new circumstances in cyberspace and no regulations apply, causing uncertainty and very high business risks.

The development of the use of electronic contracts has various consequences in various fields of law. The formation of an agreement relationship in electronic transactions is basically based on the agreement of the parties to carry out a certain legal action. The provisions of Article 1313 of the Civil Code show that agreements can also be born through electronic contract mechanisms. Therefore, the aspects of the validity of the agreement as stipulated in the Civil Code need to be carefully considered so that contracts made electronically can be recognized and accepted as valid (Asmana et al. 2025).

In Indonesian law, the principle of freedom of contract as stipulated in Article 1338 paragraph (1) of the Civil Code emphasizes that every legally made agreement is binding on

the parties as per the law. This provision provides flexibility for the parties to determine the content, partners, as well as the form and implementation of the agreement, both written and unwritten. In order for the agreement to have evidentiary force in the event of a dispute, all the conditions for the validity of the contract must be met so that the agreement acquires binding force and must be obeyed by the parties (Susanti 2024).

As technological advances continue to take place, the patterns and mechanisms of trading activities have also undergone significant transformations. One form of change appears in the use of electronic signatures in making agreements. This instrument works through the application of cryptographic technology, especially public key cryptography, and can only be used after the agreement of the parties as required in Article 1320 of the Civil Code (Mufrihah and Najmudin 2024).

The validity of an agreement relates to the legal recognition of a contract. An agreement is considered valid if it meets the elements of Article 1320 of the Civil Code, namely agreement, the competence of the parties, certain objects, and halal causes. The non-fulfillment of one of the elements can cause the agreement to be void or can be canceled, so that validity is the main basis for the formation of a binding alliance. Legal certainty requires that the agreement made valid can be enforced and provides clear protection for the rights and obligations of the parties. Stable and predictable rules are needed so that transactions, both conventional and digital, can be carried out safely. In electronic contracts, the validity assessment is not only based on the terms of the agreement according to the Civil Code, but also includes the identification of the parties, the authentication of electronic signatures, and the reliability of the electronic system. The ITE Law and its amendments provide a legal basis for electronic contracts and affirm that electronic agreements are valid insofar as they meet the requirements of a general agreement (Sopiani et al. 2024).

Although the position is normatively equivalent, judicial practice often finds it easier to accept physical documents as evidence. With the increase in digital transactions, legal certainty for electronic contracts needs to be strengthened through the recognition of electronic signatures that meet security standards and the legalization of electronic documents as evidence. To equalize legal certainty between electronic and conventional contracts, it is necessary to strengthen technical regulations, increase digital legal literacy, and develop technological infrastructure that is able to ensure data security and integrity. Thus, the legal system can adapt to technological developments and still effectively protect the rights of the parties (Sterisa 2025).

Within the framework of the ITE Law, agreements made electronically are still recognized as valid as long as they meet the elements of the validity of the agreement, such as the existence of an agreement, the skills of the parties, the permitted objects, and the use of valid electronic signatures. The regulation on electronic signatures and data protection in the ITE Law provides a strong legal basis as well as a guarantee of security for the implementation of digital agreements in Indonesia (Pitaloka and Sudharma 2025). The success of a transaction is highly dependent on the contract on which the relationship between the parties is based. To ensure the purpose of the transaction is protected, the contract must meet the legal requirements. Because electronic and conventional contracts basically have a similar character, they are still

related to the provisions of Article 1320 of the Civil Code as the foundation of validity. However, although the ITE Law regulates electronic contracts, the regulation does not detail the conditions for the validity of contracts clearly as stipulated in the Civil Code. This condition poses a juridical constraint, considering that the clarity of contract terms is very important for the sake of law and order and the protection of the rights of the parties in the event of a default (Scotland, 2025).

Validity in e-commerce has an important role because it determines the clarity of the status of the legal subject, prevents fraud, ensures the party responsible for damages, and increases consumer trust. In this context, validity relates to the role of the certification body. The ITE Law does not use the term Certification Authority (CA), but refers to it as a "reliability certification body", which is an independent institution recognized and supervised by the government to conduct audits and issue reliability certificates in electronic transactions (Nur Afifah 2025). Electronic agreements face important challenges Related data security of the parties. In online transactions, the use of electronic signatures is a crucial element to ensure the validity of an agreement. An electronic signature is considered valid if it meets the provisions of Article 11 of Law No. 11 of 2008 concerning ITE and Article 59 of Government Regulation No. 82 of 2012 concerning the Implementation of Electronic Systems and Transactions. If these conditions are met, then an electronic signature has legal consequences and evidentiary force equivalent to a conventional signature (Situngkir and Napitupulu 2025).

Even so, users must still pay serious attention to the security of personal data, especially since Indonesia does not yet have a special law regarding Protection personal data, except for Permenkominfo No. 20 of 2016 which is still limited in nature. This condition requires the government to immediately establish a more comprehensive regulation to ensure data privacy and security in electronic agreements. Strengthening these regulations is important to increase public confidence in the use of digital contracts in the electronic transaction environment (2025).

### **Juridical Analysis of the Validity of Electronic Signatures in E-Commerce Transactions: A Legal Perspective of Agreements and Legal Certainty**

Based on an analysis of the provisions of the Civil Code and the ITE Law, it can be emphasized that the validity of electronic signatures in digital agreements in e-commerce transactions is normatively recognized as valid as long as it meets the legal requirements of the agreement as stipulated in Article 1320 of the Civil Code. The agreement of the parties, legal skills, certain objects, and *halal causa* remain the main foundation for the formation of an alliance, regardless of the media or the form of the contract. The ITE Law functions as a *lex specialis* that expands the legal recognition of electronic documents and signatures as legal evidence, so that juridically electronic contracts have an equivalent position to conventional contracts. Thus, the formulation of the problem regarding the validity of electronic signatures can be answered that its legality does not stand alone, but is integrated with the legal regime of agreements that have been in force for a long time.

Although normative recognition has been given, the results of the analysis show that the application of electronic signatures in e-commerce transaction practices still faces significant obstacles, especially in the aspect of proof. Electronic signatures that do not meet the system's reliability criteria or are not supported by electronic certificates have the potential to be seen as

weak in the evidentiary process in court. This causes legal uncertainty for the parties, especially when a contractual dispute occurs. Thus, the formulation of the problem related to the extent to which legal regulation is able to provide legal certainty can be answered that the existing regulatory framework has not fully guaranteed the effectiveness of legal protection in the practice of digital transactions.

The implication of this condition is the emergence of a gap between legal norms and the reality of their application. Formal recognition of electronic signatures has not been fully followed by uniform understanding and acceptance among business actors, the public, and law enforcement officials. As a result, the legal certainty expected from the use of electronic contracts has not been optimally realized. These findings show that existing legal arrangements still need to be strengthened, both through technical regulations and improving digital legal literacy, so that the main goal of contract law, which is to ensure certainty and protection of the rights of the parties, can be achieved.

From the perspective of treaty law theory, the principle of freedom of contract as stipulated in Article 1338 of the Civil Code provides space for the parties to determine the form and medium of the agreement, including the use of electronic signatures. The findings of this study are in line with the view of previous research that electronic contracts are a modern embodiment of this principle. However, unlike some previous studies that tend to emphasize normative equivalence between electronic and conventional contracts, this study shows that this equivalence has not been fully reflected in the practice of legal proof, thus raising the problem of legal certainty.

A number of previous studies have focused more on the formal recognition of electronic signatures as legal evidence under the ITE Law. This study expands the discourse by showing that normative recognition alone is not enough without the support of adequate technical and institutional infrastructure. Thus, this study fills the gap in studies that have not discussed the relationship between the reliability of electronic systems, the role of certification bodies, and the effectiveness of proof in e-commerce disputes, which have tended to be ignored in conventional normative law research.

One of the problematic findings in this study is the normative tension between the Civil Code and the ITE Law. The Civil Code expressly regulates the legal conditions of agreements, while the ITE Law does not re-detail the requirements for the validity of electronic contracts, but only recognizes its existence. This ambiguity gives rise to different interpretations in practice, especially when disputes arise. This conflict of norms is not a direct contradiction, but in the form of a vacuum in technical arrangements that has an impact on legal uncertainty in the implementation of electronic contracts.

The findings of this research can be understood within the framework of treaty legal theory, electronic proof theory, and the principle of legal certainty. In the theory of proof, evidence must be able to guarantee the authentication and integrity of documents, which in the context of electronic contracts can only be fulfilled through reliable and certified electronic systems. The principle of legal certainty demands that legal norms are not only textually clear, but can also be applied consistently and predictably. Therefore, the validity of electronic signatures must be understood not solely as fulfilling formal requirements, but as a legal

instrument that requires technical and institutional regulatory support to truly provide certainty and legal protection in e-commerce transactions.

## CONCLUSION

The development of information technology has changed the pattern of transactions and legal relations of the community, especially in the contractual realm through the presence of electronic agreements and signatures. In the context of e-commerce transactions, electronic contracts are normatively recognized as valid based on the provisions of Article 1320 of the Civil Code and the Electronic Information and Transaction Law (ITE Law). Thus, the validity of a digital agreement is not determined by the form or medium of the agreement, but by the fulfillment of the elements of the agreement, the competence of the parties, certain objects, and causa that is halal, which is strengthened through the use of electronic signatures as a means of authenticating the consent of the parties. However, the results of the analysis show that the normative recognition has not been fully followed by the effectiveness of its application in practice. Electronic contracts and electronic signatures still face various challenges, especially related to aspects of proof in court, the reliability of electronic systems, data security, and low digital legal literacy among business actors and the public. The use of electronic signatures requires compliance with authentication standards and system reliability as stipulated in the ITE Law and Government Regulation Number 82 of 2012 so that it has legal force and provable power equivalent to conventional signatures. Non-compliance with these standards has the potential to create legal uncertainty and weaken the protection of the rights of parties in electronic transaction disputes.

This study recommends the need to strengthen more detailed technical and operational regulations regarding electronic signatures, including standardization of system reliability and strengthening the role of electronic certification bodies. In addition, harmonization between the provisions of the Civil Code and the ITE Law needs to be continuously developed so as not to create room for different interpretations in practice. Increasing digital legal literacy, strengthening personal data protection, and increasing the capacity of law enforcement officials in understanding electronic evidence are also strategic steps to ensure legal certainty, prevent abuse, and increase public trust in digital transactions in Indonesia.

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