

## Digital Signatures as Evidence in Civil Disputes in Indonesia

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Received: 12 October 2025

Revised: 18 October 2025

Accepted: 10 October 2025

Published: 14 October 2025

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**Abstrak:** *The development of information technology and digital transformation has brought significant changes to the Indonesian civil law system, particularly in the aspect of legal evidence. One important instrument in electronic transactions is the digital signature, which serves to guarantee the authenticity, integrity, and legal responsibility of the parties. This study aims to analyze the position and evidentiary power of digital signatures as electronic evidence in the Indonesian civil law system. The research method used is normative juridical with a statutory, conceptual, and case study approach, supported by primary, secondary, and tertiary data. The results of the study indicate that digital signatures have been legally recognized based on Article 11 of the ITE Law and its derivative regulations, but their implementation still faces normative and technical obstacles, especially in the aspects of authentication and judicial officials' understanding of digital technology. In conclusion, although digital signatures have the same legal force as conventional signatures, regulatory updates and increased legal capacity are needed so that their use can provide certainty, justice, and optimal legal benefits.*

**Keywords:** *Digital Signature; Electronic Evidence; Civil Law*

### INTRODUCTION

Advances in information technology have fundamentally changed the patterns of social, economic, and legal interactions in modern society. The digital era, characterized by an all-online system, brings efficiency and speed to various activities, including legal transactions that previously could only be conducted conventionally. This change has had a significant impact on the structure of Indonesian civil law, which was originally designed for a physical world based on paper documents. The legal system is now required to adapt to the digital reality to ensure legal certainty and justice amidst changing patterns of communication and transactions. Digital transformation has given rise to the phenomenon of a paperless system, where agreements, sales transactions, and even financial services are now conducted electronically. This situation broadens the scope of civil law, particularly in the aspects of

obligations and evidence. While in the past, contracts required physical meetings and written documents as proof of agreement, now the entire process can be conducted electronically, supported by digital signatures. This situation demonstrates that law cannot remain static; it must adapt to technological developments to keep up with global social and economic dynamics.<sup>1</sup>

Signatures have fundamental significance in the civil law system because they function as proof of agreement and legal responsibility of the parties.<sup>2</sup> According to Article 1869 of the Civil Code, a signature is a form of authentication that demonstrates a person's will to bind themselves to an agreement. Traditionally, a signature is understood as a physical handwriting on paper, which is a legal requirement for written documents. According to Sudikno Mertokusumo, a signature is not only a symbol of will but also a formal means of proof that

<sup>1</sup> Barkatullah, A. H. (2019). *Hukum Transaksi Elektronik di Indonesia: sebagai pedoman dalam menghadapi era digital Bisnis e-commerce di Indonesia*. Nusamedia. hlm. 32

<sup>2</sup> Wahyuni, E., Rahman, S., & Risma, A. (2022). Keabsahan Digital Signature/Tanda tangan Elektronik Dinjau Dalam Perspektif Hukum Perdata dan UU ITE. *Journal of Lex Generalis (JLG)*, 3(5), 1082-1098.

demonstrates the signatory's personal involvement in a legal agreement.<sup>3</sup>Technological advancements have brought fundamental changes to the way people sign legal documents. Digital signatures have emerged as a modern solution, replacing the function of conventional signatures in electronic transactions. Through a system of encryption and digital certificates, these signatures guarantee the authenticity of data and the identity of the signer. Their use has expanded across e-commerce, banking, fintech, and government administration, marking a paradigm shift toward legal digitization.<sup>4</sup>However, various questions have arisen regarding the validity and evidentiary power of digital signatures in the Indonesian legal system, which is still rooted in conventional evidentiary concepts.

The legal basis for digital signatures in Indonesia is regulated in Law Number 11 of 2008 concerning Electronic Information and Transactions (ITE Law) and its amendments, as well as its derivative regulations such as Government Regulation Number 71 of 2019 and Ministerial Regulation of Communication and Information Technology Number 11 of 2018. Article 11 of the ITE Law stipulates that electronic signatures have valid legal force if they meet certain requirements, including being verifiable and showing the identity of the signatory. This recognition expands the scope of legal evidence in the digital era and affirms that electronic documents have equal standing with written documents. According to Yahya Harahap, electronic evidence is a form of

modernization of procedural law that remains based on the principle of authenticity of evidence.<sup>5</sup>

In judicial practice, the use of digital signatures still faces conceptual and technical challenges. Issues arise in proving the authenticity of electronic data, system security, and the validity of certifications issued by electronic certification authorities. Some judges still hold differing views regarding the evidentiary value of digital signatures, particularly when electronic data is easily manipulated. The absence of established jurisprudence also increases the risk of legal uncertainty. This situation demonstrates the need for harmonization between positive legal norms and technological practices to prevent their application from giving rise to differing interpretations.<sup>6</sup>

The distinction between digital signatures and traditional electronic signatures also often causes confusion in their application. Not all electronic signatures have the same legal status; digital signatures use encryption and certificate technology to guarantee data authenticity, while simple electronic signatures do not always guarantee integrity.<sup>7</sup>This distinction has significant legal implications as it concerns the strength of evidence in court. A proper understanding is necessary so that the public and law enforcement can objectively and proportionally assess the validity of digital evidence. Recognizing digital signatures as valid evidence is crucial to ensuring efficiency and legal certainty in modern civil transactions.<sup>8</sup>In legal disputes, written evidence

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<sup>3</sup> Pelapu, I. J. (2024). KEPASTIAN HUKUM PENGGUNAAN TANDA TANGAN ELEKTRONIK DALAM AKTA NOTARIS. *LEX PRIVATUM*, 14(2).

<sup>4</sup> Susilowati, D. E., Muhtarom, M., & Junaidi, A. (2025). Analisis yuridis keabsahan tanda tangan digital dalam transaksi e-commerce di Indonesia. *Jurnal Penelitian Serambi Hukum*, 18(01), 17-26.

<sup>5</sup> Rum, G. W. (2025). Penggunaan alat bukti elektronik dalam proses peradilan perdata. *Jurnal Multidisiplin Ilmu Akademik*, 2(1), 61-68

<sup>6</sup> Bachsin, A., Ekoputro, H. F. H., Ranggana, H. I. A., Ramadhan, J. N. O., Fadhillah,

M. S., & Siswajanthi, F. (2025). Kedudukan dan Penilaian Hakim terhadap Alat Bukti Elektronik dalam Proses Pembuktian Perkara Perdata. *Al-Zayn: Jurnal Ilmu Sosial & Hukum*, 3(3), 2364-2370.

<sup>7</sup> Mayana, R. F., & Santika, T. (2021). Legalitas tanda tangan elektronik: posibilitas dan tantangan notary digitalization di Indonesia. *ACTA DIURNAL Jurnal Ilmu Hukum Kenotariatan*, 4(2), 244-262.

<sup>8</sup> Wahyuni, E., Rahman, S., & Risma, A. (2022). Keabsahan Digital Signature/Tanda tangan Elektronik Dinjau Dalam Perspektif Hukum Perdata dan UU ITE. *Journal of Lex Generalis (JLG)*, 3(5), 1082-1098.

remains the primary instrument for proving the legal relationship between parties. Therefore, the validity of digital signatures will strengthen the legal standing of electronic agreements and provide a basis for trust for digital economy actors. Laws that are responsive to technological innovation will strengthen substantive justice and support efficiency in civil dispute resolution.<sup>9</sup>

In a normative context, this issue reflects the vagueness of norms in the Indonesian legal system, as regulations regarding digital signatures exist in legislation, but lack interpretive clarity and uniform application guidelines in practice. Inconsistencies in judicial practice, weak legal understanding of digital technology among law enforcement officials, and the lack of clear jurisprudence have led to uncertainty in civil law protection.

## RESEARCH METHODS

This research uses a normative juridical method, namely legal research that focuses on written legal norms as the basis for analysis of the issues studied.<sup>10</sup> According to Bahder Johan Nasution, normative legal research is research that aims to examine legal principles, legal systematics, synchronization between regulations, and legal doctrine in order to answer problems that arise in practice.<sup>11</sup> The approaches used include a statutory approach to examine regulations such as Law Number 11 of 2008 concerning Electronic Information and Transactions and its amendments, a conceptual approach to examine the concept of digital signatures and their evidentiary power in civil law, and a case study approach to trace the application of these norms in judicial practice. The data sources used consist of primary data,

in the form of laws and court decisions; secondary data, in the form of legal literature, scientific journals, and expert opinions; and tertiary data, such as legal dictionaries and legal encyclopedias that strengthen conceptual interpretation.

## RESULT AND DISCUSSION

### *The Position of Digital Signatures in the Indonesian Civil Law System*

The development of information technology has brought significant transformations to the legal world, particularly in the system of proof and contract enforcement. In the context of modern civil law, digital signatures have emerged as a crucial instrument for ensuring the validity of electronic transactions. These signatures serve not only as a symbol of consent but also as a means of identity verification and a guarantee of the integrity of electronic documents. In a digital society, the existence of digital signatures has become an unavoidable legal requirement to ensure trust, security, and validity in various online transactions.<sup>12</sup>

Conceptually, a digital signature differs from a traditional electronic signature. An electronic signature is simply a mark, symbol, or process attached to an electronic document to indicate approval. Meanwhile, a digital signature uses cryptographic encryption technology to secure data and authenticate the signer's identity.<sup>13</sup> In other words, digital signatures have stronger technical and legal dimensions because they involve electronic certificates issued by trusted authorities. This fundamental difference emphasizes that digital signatures are not merely symbolic but also possess higher evidentiary value. The primary function of digital signatures in civil law

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<sup>9</sup> Arvisya, W. C., & Putra, M. A. P. (2025). KEKUATAN MENGIKAT PERJANJIAN ELEKTRONIK DAN IMPLIKASINYA TERHADAP KEPASTIAN HUKUM TRANSAKSI DIGITAL DI INDONESIA. *Jurnal Media Akademik (JMA)*, 3(11).

<sup>10</sup> Rizkia, N. D., & Fardiansyah, H. (2023). *Metode Penelitian Hukum (Normatif dan Empiris)*. Penerbit Widina. hlm. 28

<sup>11</sup> Benuf, K., & Azhar, M. (2020). Metodologi penelitian hukum sebagai instrumen

mengurai permasalahan hukum kontemporer. *Gema Keadilan*, 7(1), 20-33.

<sup>12</sup> Yuniati, T., & Sidiq, M. F. (2020). Literature review: Legalisasi dokumen elektronik menggunakan tanda tangan digital sebagai alternatif pengesahan dokumen di masa pandemi. *Jurnal RESTI (Rekayasa Sistem Dan Teknologi Informasi)*, 4(6), 1058-1069. .

<sup>13</sup> Syakbani, B. (2013). Kekuatan Pembuktian Dokumen Elektronik Dengan Tanda Tangan Elektronik Dalam Proses Persidangan Perdata. *Jurnal Valid Vol*, 10(4), 63-69.

encompasses three important aspects: authentication, integrity, and non-repudiation. Authentication ensures that the signer's identity can be verified, integrity ensures that the document remains unchanged after it is signed, and non-repudiation prevents the signer from later denying their involvement. These principles underpin the reliability of digital signatures in maintaining the validity of electronic transactions and avoiding disputes that may arise from data manipulation or identity denial.<sup>14</sup>

The working principle of a digital signature is based on a public key cryptography system (public key infrastructure), which consists of a pair of private and public keys. The private key is used to sign documents, while the public key is used to verify the signature.<sup>15</sup> This system creates a multi-layered security mechanism that ensures that only authorized signatories can perform legal actions through their digital signatures. This technology is a crucial foundation for building legal trust in electronic documents in the digital era. In the context of modern civil transactions, digital signatures play a vital role in various activities such as online contracts, e-commerce transactions, and e-banking services. Their use speeds up the agreement process, reduces administrative costs, and increases the efficiency of cross-border transactions. The need for a fast and secure evidence system makes digital signatures a relevant instrument in contemporary legal practice. With the increasingly widespread use of digital technology, the validity of digital signatures in the Indonesian legal system has become a crucial issue requiring in-depth study.

Legally, the recognition of digital signatures in Indonesia is regulated by Law Number 11 of 2008 concerning Electronic Information and Transactions (ITE Law), as amended by Law Number 19 of 2016. These two laws provide the legal basis for electronic

information and electronic signatures to have valid legal force. This regulation confirms that Indonesian law has accommodated digital transformation in the field of evidence law and electronic transactions, while also legitimizing digital signatures as part of the national legal system. Article 11 of the ITE Law is the main provision that confirms the validity of digital signatures. This article states that electronic signatures have legal force and valid legal consequences as long as they meet authentication and integrity requirements, such as being able to identify the signatory and demonstrating that the document has not been altered after being signed. This provision demonstrates that the validity of a digital signature depends on fulfilling technical and administrative aspects that guarantee the authenticity and integrity of electronic documents.

Strengthening regulations regarding digital signatures is also clarified through Government Regulation Number 71 of 2019 concerning the Implementation of Electronic Systems and Transactions (PSTE). This regulation governs the implementation of reliable and secure electronic transactions and requires the existence of an electronic certification provider authorized to issue digital certificates. The purpose of this regulation is to ensure that every digital signature can be verified through a government-recognized system, thus optimally guaranteeing legal validity and user data security. Ministerial Regulation Number 11 of 2018 also strengthens the technical and institutional aspects of digital signature management. This regulation establishes the mechanism for administering electronic certificates and authorizes Electronic Certification Providers (PSrE) to issue, verify, and revoke digital certificates. The existence of PSrE is crucial in maintaining the reliability of the digital signature system, as they act as

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<sup>14</sup> Trishadiatmoko, A. N. A. (2025). DAMPAK TANDA TANGAN ELEKTRONIK TERHADAP KEAMANAN DAN KEPERCAYAAN DALAM TRANSAKSI DIGITAL: KAJIAN EMPIRIS DAN ANALISIS KEBIJAKAN DI INDONESIA. *Media Bina Ilmiah*, 19(12), 6549-6560. .

<sup>15</sup> Jarkasih, S., & Fatimah, U. (2022). PENGGUNAAN PUBLIC KEY INFRASTRUCTURE KUNCI PERSETUJUAN (KEY AGREEMENT). *Jurnal Tiple A Pendidikan Teknologi Informasi dan Teknologi Informasi*, 1(2), 97-102.

trusted third parties that guarantee the validity of the signatory's identity.

In civil law, digital signatures have the same position as manual signatures in the context of agreements. It functions as proof of the parties' will and agreement to the contents of the electronic contract.<sup>16</sup> As long as the requirements for authenticity and integrity are met, a digital signature is considered valid and legally binding. Thus, the existence of digital signatures expands the scope of Articles 1320 and 1338 of the Civil Code concerning the validity of agreements and the principle of freedom of contract in digital form. The relationship between digital signatures and written evidence is also regulated in Article 1866 of the Civil Code, which recognizes written evidence as the primary evidence in civil cases. Digitally signed electronic documents are now positioned on a par with conventional written documents, as long as they demonstrate the authenticity and intent of the signing party. This recognition strengthens the legitimacy of digital signatures as valid evidence in civil litigation in Indonesia.

A comparison between digital signatures and manual signatures shows significant differences in their formal and material strength. Manual signatures have symbolic value attached to the physical document, while digital signatures are supported by an encryption system that can be objectively verified. From an evidentiary perspective, digital signatures are even considered stronger because they are able to guarantee the integrity and authenticity of data without human intervention after the document is signed. The evidentiary strength of digitally signed electronic documents is also explicitly recognized in Article 5 paragraph (1) of the ITE Law, which states that electronic information and electronic documents are valid legal evidence. This validity makes digital

documents equal to written documents in the context of evidentiary law, so that judges can use them as a basis for deciding civil disputes. This confirms that the Indonesian legal system has recognized the principle of digital equivalence or legal equality between physical and electronic documents.<sup>17</sup>

The evidentiary power of a digital signature depends on three essential elements: the authenticity of the signer's identity, the integrity of the document's content, and the validity of the electronic certification. An electronic certificate serves as authentication evidence, ensuring that the signer is the party who claims to be the signatory and that the document's content has not been altered after it was signed. This mechanism creates a layer of legal trust that serves as the basis for assessing the validity of digital evidence in court. The function of electronic certification in the digital legal system is inseparable from the role of the PSrE as the implementing authority recognized by the government. Electronic certificates issued by the PSrE guarantee the legal validity and security of digital transactions.<sup>18</sup> The mechanisms for issuing, validating, and revoking certificates are strictly regulated to prevent misuse or identity fraud. The existence of the PSrE ensures the presence of a neutral and trusted third party to guarantee the authenticity of digital signatures.

The status of digital signatures accompanied by electronic certificates is fully recognized in modern legal transactions. However, if a digital signature is not accompanied by an official certificate from the PSrE, its validity can be questioned. In this case, the proof of authentication becomes weak and vulnerable to refutation. Such situations require legal certainty to regulate the certificate validation mechanism to avoid future disputes. Legal certainty is a fundamental principle in the use of digital signatures. Clear and firm legal

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<sup>16</sup> Slamet, T. S., & Paliling, M. M. (2019). Kekuatan Hukum Transaksi Dan Tanda Tangan Elektronik Dalam Perjanjian. *Paulus Law Journal*, 1(1).

<sup>17</sup> Ridha, M., Badali, MA, & Lahmudinnur, L. (2025). Innovation in Legal Drafting for Electronic Contract Preparation (E-Contract) in the Digital Era. *Indonesian Journal of Islamic*

*Jurisprudence, Economic and Legal Theory*, 3(2), 1300-1313.

<sup>18</sup> Setiawan, A. B. (2015). The Ecosystem of Electronic Certificate Implementation in Electronic Commerce System. *Jurnal Penelitian Dan Pengembangan Komunikasi Dan Informatika*, 6(2).

norms are needed to protect users and ensure trust in digital transaction systems. In the context of civil law, this certainty is closely related to the principles of trust and good faith as stipulated in Article 1338 of the Civil Code. The existence of digital signatures strengthens the application of these principles in the modern context, as it ensures that every transaction is conducted on the basis of trust and legal responsibility.<sup>19</sup>

In the civil evidence system, digital signatures play a role in strengthening the principles of justice and legal efficiency. Recognition of digital signatures not only speeds up transaction processes but also increases transparency and accountability. Their use demonstrates the evolution of the legal paradigm from a physical document-based system to an electronic system that is more adaptive to the needs of modern society. Despite legal recognition, the application of digital signatures still faces various normative and implementation obstacles. The lack of technical regulations in civil procedural law regarding the mechanism for digital document evidence is one of the main obstacles. Judges' and legal practitioners' lack of understanding of the technical aspects of cryptography also leads to inconsistencies in the assessment of digital evidence in court. The risk of misuse of digital signatures, such as forgery or unauthorized use, is also a threat that must be anticipated. Weaknesses in digital security systems can open up opportunities for cybercrimes with serious legal implications. Therefore, adequate judicial guidelines and technical training are needed for law enforcement officers to assess digital evidence objectively and accurately.

### ***The Position of Digital Signatures in the Indonesian Civil Law System***

A digital signature is a modern legal instrument that is an integral part of electronic evidence as regulated in Article 5 paragraph (1) of Law Number 11 of 2008 concerning

Electronic Information and Transactions (ITE Law). This article emphasizes that electronic information and electronic documents are valid legal evidence, indicating that Indonesian law has recognized the existence of digital evidence on a par with conventional evidence. Digital signatures serve to strengthen the authenticity and integrity of electronic documents, so that they can be used as a basis for evidence in civil court proceedings. Digitally signed electronic documents have the same evidentiary value as written documents if they meet the formal and material requirements as regulated in civil procedural law. Formal requirements include the existence of a valid digital signature, while material requirements relate to the authenticity of the document's contents and the identity of the signatory. Fulfillment of these two elements makes a digital document equivalent to a private deed in the context of civil evidence. Thus, the legitimacy of a digital signature depends not only on its technical existence, but also on its compliance with recognized legal principles of evidence.<sup>20</sup>

The primary function of a digital signature in civil disputes is to demonstrate the identity of the signatory, prove the agreement of the parties, and maintain the integrity of the document's contents so that they are not altered after signing. This function aligns with the principles of free will and honesty, which underlie the validity of an agreement under Articles 1320 and 1338 of the Civil Code. In electronic transactions, a digital signature serves as a manifestation of consent expressed electronically, without diminishing the legal force of the agreement. In practice, digital signatures are used to prove the validity of electronic contracts and the legal responsibilities of the parties involved. This digital evidence serves as a legally accountable representation of will, similar to a conventional signature on a physical document. Its use is common in online business contracts, digital financial services, and e-commerce transactions that require legal validity and identity certainty.

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<sup>19</sup> Atmoko, D., & Noviriska, N. (2024). Kepastian Hukum dalam Transaksi Online: Peran Asas Itikad Baik Berdasarkan Hukum Perdata Indonesia. *Binamulia Hukum*, 13(2), 421-428.

<sup>20</sup> Daffa, M. F., Rahman, S., & Qahar, A. (2023). Kekuatan Pembuktian Tanda Tangan Elektronik sebagai Alat Bukti dalam Perkara Perdata. *Journal of Lex Philosophy (JLP)*, 4(1), 205-221.

In this way, digital signatures play a strategic role in adapting civil law mechanisms to developments in information technology.<sup>21</sup>

Digitally signed electronic evidence has formal evidentiary force if it can show that the document was created, approved, and sent by an authorized party. This formal evidentiary force reflects that the document has fulfilled the authentication procedures as stipulated in the electronic certification system. Meanwhile, the material evidentiary force depends on the authenticity of the document, the validity of the electronic certificate, and the system's ability to prove that the document's contents have not been changed after the signing process. The assessment of the formal and material evidentiary force is carried out by a judge based on the principle of freedom to prove (*freies beweisrecht*) as applicable in civil procedural law. The judge is authorized to assess the validity of a digital signature based on digital verification tools, electronic certificates, and other technical evidence such as system logs and metadata. In the event of a denial of the validity of a digital signature, the burden of proof can be shifted to the denying party as stipulated in the principle of *onus probandi incumbit actori*, namely, whoever alleges must prove.

Normatively, Indonesian courts have recognized digital signatures as valid evidence, but their implementation still faces limitations. Several civil decisions demonstrate differing judges' interpretations of the evidentiary force of digital signatures, particularly when they are not accompanied by an official electronic certificate from an Electronic Certification Provider (PSrE). In such situations, judges often consider supporting evidence such as electronic correspondence, transaction records, or digital audit results as supporting evidence. These differing interpretations among judges stem from varying understandings of the

technical and legal aspects of digital signatures. Edmon Makarim argues that the validity of a digital signature is determined not only by the existence of cryptographic technology but also by legal recognition of the certification system used. This means that the evidentiary force of a digital signature will only be complete if supported by a mutually reinforcing legal and technical infrastructure. Without it, its evidentiary value will be limited.<sup>22</sup>

Electronic certificates are a crucial element in ensuring the authentication and validity of digital signatures. The Electronic Signature Certificate (PSrE), registered with the Ministry of Communication and Information Technology, serves as the official verification authority for the signatory's identity. In the context of proof, electronic certificates serve as a comparison between digital data and the legal identity of the signatory. If the certificate is valid and verified, the digital signature has full evidentiary force, as stipulated in the national legal system.<sup>23</sup> The absence of a valid electronic certificate can reduce the evidentiary value of a digital signature. Documents not verified by the PSrE may be deemed to lack full evidentiary power, although they can still be used as indicative or additional evidence. In judicial practice, this requires caution for parties conducting electronic transactions to always ensure the validity of the digital certificates used to prevent them from losing their legal force in future evidence.

Technical challenges in digital signature verification include the potential for digital forgery, cyberattacks, or modification of electronic data after the document is signed. From a legal perspective, the absence of detailed Supreme Court guidelines governing procedures for examining digital evidence has led to inconsistent practice in courts. The lack of established standards for digital forensic verification also makes it difficult for judges to

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<sup>21</sup> Dahlia, M., & Susetio, W. (2023). Tinjauan Yuridis Penggunaan Tanda Tangan Digital Dalam Perjanjian Jual Beli. *Jurnal Multidisiplin Indonesia*, 2(8), 2277-2289. .

<sup>22</sup> Tektona, R. I., & Laoly, S. R. (2023). Kepastian Hukum Tanda Tangan Digital Pada Platform PrivyID Di Indonesia. *ACTA DIURNAL Jurnal Ilmu Hukum Kenotariatan*, 6(2), 245-253.

<sup>23</sup> Dewi, D. C., Amelia, D., Pratama, F. R., Shidiq, F., Ferdansyah, F., & Anugrah, D. (2024). Tanda Tangan Elektronik Sebagai Solusi Hukum Perikatan Dalam Era Digital Di Indonesia. *Letterlijk*, 1(2), 217-230.

objectively assess the authenticity of digital signatures. Low digital literacy among law enforcement officials is a significant obstacle to the effective use of digital evidence. Many judges and legal practitioners lack a technical understanding of encryption mechanisms, certification, and digital verification procedures. As a result, electronic evidence is often treated with caution, even tending towards conservative treatment. However, according to Ahmad M. Ramli, the validity of digital signatures should be understood within the framework of trust between the signatory, the electronic system administrator, and the certification authority.<sup>24</sup>

Judges play a crucial role in ensuring the objectivity of digital evidence assessments. In many cases, judges need to be supported by expert witnesses in information technology or digital forensics to explain the authentication process and technical validity of digital signatures. The involvement of experts will help judges understand the technological context behind digital documents, enabling more accurate decisions and adhering to the principles of scientific evidence. Comparisons with international practice show that countries such as Singapore, Malaysia, and the European Union already have comprehensive regulations regarding digital signatures, such as the Electronic Transactions Act and the eIDAS Regulation.<sup>25</sup> The regulation governs technical standards, the responsibilities of certification providers, and procedures for recognizing digital evidence in court. Indonesia needs to strengthen its legal and technical framework to align with international practices, while simultaneously enhancing the competitiveness of national law in cross-border transactions.

Strengthening national law regarding digital signatures will reinforce the principles of legal certainty, justice, and expediency. Legal certainty is achieved through the explicit recognition of electronic evidence in the ITE

Law and its derivative regulations. The aspect of legal expediency is reflected in the efficiency of evidentiary processing and the acceleration of dispute resolution through digital evidence. Justice can only be ensured if the assessment of digital evidence is conducted equitably, transparently, and based on adequate technical understanding.

## CONCLUSION

Digital signatures are a legal innovation that allows electronic documents to have the same legal force as written documents, provided they meet the formal and material requirements stipulated in the ITE Law and its derivative regulations. Their existence not only serves as a means of proving the identity and legal will of the parties, but also as a symbol of legal adaptation to the digital era. Although recognized normatively, the implementation of digital signatures still faces obstacles, both technical and regulatory, as well as the understanding of judicial officials, which requires legal harmonization and increased human resource capacity in the field of digital law.

From a legal perspective, digital signatures have significant potential to strengthen legal certainty, fairness, and utility in electronic transactions and civil dispute resolution. However, to optimize their evidentiary power, they require the support of a legitimate electronic certification system, comprehensive judicial guidelines, and regulations responsive to developments in information technology. Strengthening digital legal infrastructure is expected to address ongoing gaps and ambiguities in norms, while ensuring that Indonesian law remains relevant in addressing the challenges of modern evidentiary law in the era of digital transformation.

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<sup>25</sup> Lase, I. N. (2024). Dampak Transformasi Digital terhadap Hukum Bisnis: Menghadapi Tantangan Hukum dalam Perdagangan Elektronik. *Jurnal Ilmu Hukum, Humaniora dan Politik (JIHHP)*, 5(1).

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