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A Critical Examination of the Electronic Evidence Mechanism in Indonesian Procedural Law

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Abstract

The digital era has profoundly transformed the Indonesian judicial system, particularly in the realm of evidentiary law. The emergence of electronic evidence such as digital documents, online communications, and electronic transactions has enriched the evidentiary framework while simultaneously presenting significant challenges concerning authenticity, integrity, and admissibility. Although the Electronic Information and Transactions Law formally recognizes electronic evidence, inconsistencies arise due to its disharmony with procedural codes such as the Criminal Procedure Code, Het Herziene Indonesisch Reglement (HIR), and Rechtsreglement Buitengewesten (RBg), which remain oriented toward conventional forms of proof. This normative-comparative legal study employs statute, case, and comparative approaches, analyzing Indonesian regulations, judicial decisions, and international standards including the UNCITRAL Model Law, the EU e-Evidence Regulation, and practices in the United States and Singapore. The findings reveal that Indonesia's regulatory framework remains fragmented, lacking uniform technical standards, forensic capacity, and judicial readiness to effectively assess electronic evidence. Comparative analysis demonstrates that advanced jurisdictions have developed integrated mechanisms such as electronic discovery (U.S.), technology courts (Singapore), and trust service regulations (EU), which ensure greater certainty and reliability. The study argues for comprehensive reform through harmonization of procedural laws, establishment of clear forensic and authentication standards, enhancement of judicial and law enforcement capacity, and adoption of best practices in line with global developments. Strengthening the electronic evidence mechanism is

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crucial to safeguard legal certainty, fairness, and due process in Indonesia's judicial system.

Keywords: Electronic Evidence, Indonesian Procedural Law, Digital Forensics, Fair Trial, Legal Reform

Introduction

The advancement of digital technology has fundamentally transformed the structure of social, economic, and political interactions across the globe.[1] In the legal domain, digitalization has brought profound consequences to judicial systems, particularly in the realm of evidentiary law.[2] Cases that once relied primarily on physical documents, witnesses, and expert testimony are now increasingly characterized by the presence of electronic evidence.[3] Digital recordings, instant messaging conversations, e-mails, digital transaction data, and electronic signatures have emerged as essential instruments submitted in court proceedings. This development enriches the evidentiary framework and paves the way for a more modern, efficient, and adaptive judicial process.[4]

Nevertheless, such progress also raises serious challenges. Electronic evidence possesses distinct characteristics compared to conventional evidence, it can be easily modified, replicated, or erased without leaving a trace. Consequently, issues of validity, authenticity,

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1 Laila Fathimah dkk., "Transformasi Komunikasi Digital: Landasan Teoretis dan Evolusi Teknologi di Era Jaringan Global," *Innovative: Journal Of Social Science Research* 5, no. 3 (2025): 7922–33.

2 Md Nazrul Islam Khan dan Ishtiaque Ahmed, "A Systematic Review of Judicial Reforms and Legal Access Strategies in the Age of Cybercrime and Digital Evidence," *International Journal of Scientific Interdisciplinary Research* 5, no. 2 (2025): 01–29.

3 Eddy Army, *Bukti Elektronik Dalam Praktik Peradilan* (Sinar Grafika, 2020).

4 Muhamad Rivaldi Prasena Guntara, "Kekuatan hukum alat bukti elektronik sebagai pembuktian di persidangan dihubungkan dengan undang-undang nomor 19 tahun 2016 tentang perubahan atas undang-undang nomor 11 tahun 2008 tentang informasi dan transaksi elektronik" (PhD Thesis, UIN Sunan Gunung Djati Bandung, 2023), https://digilib.uinsgd.ac.id/84432/.

integrity, and the safeguarding procedures of electronic evidence become critical in the context of procedural law. The lack of clarity in the regulatory framework governing electronic evidence risks undermining the principles of due process of law and fair trial, which constitute the core pillars of the judicial system.[5]

The fundamental problem lies in Indonesia's procedural law framework, which remains fragmented and lacks full harmonization. The Indonesian Code of Criminal Procedure, as the lex generalis of criminal procedure, does not explicitly recognize electronic evidence as an independent form of proof. Similarly, the Het Herziene Indonesisch Reglement (HIR) and Rechtsreglement Buitengewesten (RBg), which serve as the basis for civil procedure, remain oriented toward physical documents and provide insufficient accommodation for digital records. Formal legal recognition of electronic evidence was only introduced through Law No. 11 of 2008 on Electronic Information and Transactions (ITE Law) and its amendments. However, the implementation of this law often conflicts with prevailing procedural codes, thereby creating inconsistencies and legal uncertainty in judicial practice.[6]

This situation has significant implications for the realization of justice. Without legal certainty regarding the status of electronic evidence, the principles of a speedy, simple, and low-cost trial are difficult to achieve. Moreover, weak standards of electronic evidence open the door to manipulation, forgery, and misuse of digital evidence, potentially disadvantaging litigants. Such deficiencies not only

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5 Army, *Bukti Elektronik Dalam Praktik Peradilan*.

6 Rio Saputra dkk., *Reformasi Hukum Acara Pidana: Menyongsong KUHAP Baru* (Langgam Pustaka, 2025).

undermine the effectiveness of the judiciary but may also erode public trust in judicial institutions.[7]

Academic discourse on electronic evidence in Indonesia remains largely dominated by a normative-descriptive approach. Most studies focus narrowly on the formal legal aspects of national regulations without offering a critical analysis of legal vacuums or disharmony among existing laws. Comparative studies with international standards remain scarce, even though global frameworks such as the UNCITRAL Model Law on Electronic Commerce, the Budapest Convention on Cybercrime, and the European e-Evidence Regulation have become benchmarks for many jurisdictions in integrating electronic evidence into their procedural systems. The absence of such comparative perspectives has limited the capacity of Indonesian legal scholarship to provide comprehensive and contextually relevant solutions to the challenges of electronic evidence.[8]

Accordingly, this research seeks to provide a critical assessment of the mechanisms governing electronic evidence within Indonesia's procedural law system, while offering a reform model that is more aligned with global practices. Employing a normative-comparative approach, the study examines national regulations, court decisions, and international practices. The findings are expected to enrich academic discourse while simultaneously serving as policy recommendations for

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7 Angelina Agung Putri Zaman, *Keabsahan Pembuktian Digital Forensik Terhadap Tindak Pidana Pencucian Uang Melalui Mata Uang Virtual (Cryptocurrency)(Studi Komparatif Di Beberapa Negara)*, UNS (Sebelas Maret University), 2025, https://digilib.uns.ac.id/dokumen/detail/122074/.

8 Ummi Maskanah, "Artificial Intelligence in Civil Justice: Comparative Legal Analysis and Practical Frameworks for Indonesia," *Jambura Law Review* 7, no. 1 (2025): 225–42.

lawmakers to formulate regulations that are more coherent, adaptive, and capable of ensuring legal certainty.

Method

This study employs a normative-comparative legal research design, aiming to analyze the positive legal norms in Indonesia while simultaneously comparing them with international legal standards. The research adopts several approaches. First, the statute approach, which involves an examination of relevant legislative instruments, including the Indonesian Code of Criminal Procedure, Het Herziene Indonesisch Reglement (HIR), Rechtsreglement Buitengewesten (RBg), Law No. 11 of 2008 on Electronic Information and Transactions (ITE Law) and its amendments, as well as Law No. 11 of 2022 on Cybersecurity. Second, the case approach, which is conducted by reviewing Indonesian court decisions related to the use of electronic evidence, both in criminal cases such as corruption and violations of the ITE Law and in civil cases involving digital documents. Third, the comparative approach, which entails comparing Indonesia's electronic evidence mechanism with international legal standards, including the UNCITRAL Model Law on Electronic Commerce, the European Union's e-Evidence Regulation, as well as procedural law practices in the United States and Singapore.[9]

The data sources of this research consist of primary, secondary, and tertiary legal materials. Primary legal materials include national legislation and court decisions pertaining to electronic evidence. Secondary legal materials are drawn from academic literature, international journals, and prior scholarly studies relevant to the subject of electronic evidence. Meanwhile, tertiary legal materials comprise

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9 Jonaedi Efendi dan Johnny Ibrahim, *Metode Penelitian Hukum: Normatif dan Empiris*, Prenadamedia Group, 2018.

reports from international organizations such as the OECD and the International Telecommunication Union (ITU), which provide global perspectives on standards and practices concerning electronic evidence. All data were analyzed qualitatively, focusing on the consistency of legal norms, the effectiveness of their application in judicial practice, and their relevance to the principles of fair trial and legal certainty.[10]

Analysis and Discussion

1. The Status and Validity of Electronic Evidence in the Indonesian Procedural Law System

Electronic evidence has gained a significant position within Indonesia's procedural law since its explicit recognition under Law No. 11 of 2008 on Electronic Information and Transactions (ITE Law), as amended by Law No. 19 of 2016. Article 5 of the ITE Law affirms that electronic information and/or electronic documents, along with their printouts, constitute valid legal evidence equivalent to other forms of evidence regulated under procedural law, provided that they fulfill both formal and material requirements as stipulated by legislation. Nevertheless, this legal position often generates debate when juxtaposed with the Indonesian Code of Criminal Procedure (KUHAP) and civil procedural law, which remain predominantly oriented toward conventional forms of evidence, as reflected in Article 184 KUHAP and Article 164 HIR.[11]

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10 Komang Ayu Henny Achjar dkk., *Metode penelitian kualitatif: Panduan praktis untuk analisis data kualitatif dan studi kasus* (PT. Sonpedia Publishing Indonesia, 2023).

11 Ramiyanto Ramiyanto, "Bukti elektronik sebagai alat bukti yang sah dalam hukum acara pidana," *Jurnal Hukum dan Peradilan* 6, no. 3 (2017): 463–84.

From the perspective of Hans Kelsen's legal positivism, a legal norm is deemed valid if it is enacted by a higher legal authority and does not contradict the basic norm (Grundnorm). In this sense, the validity of electronic evidence is already fulfilled, as its existence is guaranteed by the ITE Law, a legitimate legislative product consistent with constitutional principles. However, when analyzed through Eugen Ehrlich's theory of the living law which emphasizes that law originates not only from statutes but also from the social practices embedded within society the use of electronic evidence encounters challenges. This is evident from the persistent skepticism among judges, law enforcement officials, and legal practitioners regarding the validity and authenticity of electronic evidence, particularly in criminal cases that demand a high degree of certainty concerning the originality of digital data.[12]

Furthermore, from the standpoint of evidentiary theory, which emphasizes the pursuit of material truth, electronic evidence presents inherent weaknesses due to its susceptibility to manipulation, modification, and technological engineering. Unlike physical evidence, which tends to be more stable and directly verifiable, electronic data often requires additional verification mechanisms, such as digital forensics, audit trails, and electronic chains of custody, to ensure its integrity and admissibility in court. Accordingly, the status of electronic evidence within Indonesia's procedural law may be understood as

12 Nur Talita Prapta Putri dan Ananda Aulia, "Penerapan Teori Positivisme Hans Kelsen Di Indonesia," *Das Sollen: Jurnal Kajian Kontemporer Hukum Dan Masyarakat* 2, no. 01 (2024), https://journal.forikami.com/index.php/dassollen/article/view/543.

a form of legal adaptation to technological advancements. Nonetheless, its validity and probative value remain in need of further reinforcement, both in terms of regulatory frameworks, judicial practice, and broader social acceptance.[13]

2. Challenges in Electronic Evidence in Indonesian Courts

Although Law No. 11 of 2008 on Electronic Information and Transactions (ITE Law) and its amendments have provided a legal foundation for the recognition of electronic evidence within Indonesia's procedural law, its practical application in court proceedings continues to face several serious challenges.[14]

First, normative challenges arise due to disharmony between the ITE Law and evidentiary provisions under the Indonesian Code of Criminal Procedure (KUHAP) and the civil procedural codes (HIR/RBg). Both KUHAP and HIR adhere to classical categories of evidence such as documents, witnesses, confessions, indications, and expert testimony, thereby relegating electronic evidence to a complementary role rather than recognizing it as a principal form of proof. This creates legal uncertainty, as judges often assess the probative weight of

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13 Niko Darmawan, "Kekuatan Alat Bukti Elektronik Dalam Pembuktian Tindak Pidana Ujaran Kebencian di Media Sosial (Studi Putusan Nomor 374/Pid.Sus/2024/PT.SMG)" (B.S. thesis, Fakultas Syariah dan Hukum UIN Syarif Hidayatullah Jakarta, 2024).

14 Felicia Eugenia dkk., "Tantangan Praktis dalam Proses Pembuktian Perkara Pidana: Kredibilitas Saksi dan Validitas Bukti Elektronik," *Iuris Studia: Jurnal Kajian Hukum* 5, no. 2 (2024): 492–503.

electronic evidence subjectively, in the absence of standardized guidelines.[15]

Second, technical challenges constitute significant obstacles. Electronic evidence is inherently susceptible to alteration, manipulation, or deletion without leaving visible traces. Issues of authentication and data integrity are therefore central. However, many law enforcement officers and judges lack sufficient technical knowledge of digital forensic methods, such as chain of custody, metadata analysis, or digital hashing. This gap renders electronic evidence vulnerable to dispute among litigating parties, particularly concerning its authenticity and admissibility.[16]

Third, epistemological challenges must also be considered. According to Lawrence M. Friedman's legal system theory, which emphasizes the interplay between substance, structure, and legal culture, the principal weakness lies in the cultural dimension. Many judges and legal practitioners maintain a conservative outlook, perceiving electronic evidence as less persuasive compared to physical evidence or witness testimony. This reflects a cultural resistance within the legal community toward the modernization of evidentiary practice, ultimately slowing the legal system's adaptation to developments in information technology.[17]

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15 Yusri Yusri, "Rekonstruksi Regulasi Pembuktian dalam Peradilan Perdata Berbasis Pada Nilai Keadilan" (PhD Thesis, Universitas Islam Sultan Agung, 2023), http://repository.unissula.ac.id/31129/.

16 Dewantoro Dewantoro, "Autentikasi Alat Bukti Elektronik dalam Memperlancar Pembuktian di Persidangan Pada Era Disrupsi," *Jurnal Hukum Progresif* 12, no. 2 (2024): 135–51, https://doi.org/10.14710/jhp.12.2.135-151.

17 Fara Rizqiyah Sari dan Rayno Dwi Adityo, "Efektivitas Alat Bukti Elektronik Pada Praktik Beracara Perspektif Teori Sistem Hukum Lawrence M. Friedman," *Sakina: Journal of Family Studies* 8, no. 2 (2024): 244–57.

Fourth, practical challenges persist in courtroom implementation. Electronic trials (e-court) and the use of digital documents in evidentiary proceedings are still hindered by infrastructural limitations, such as inadequate technological facilities in regional courts, a shortage of personnel trained in handling electronic evidence, and weak standardized operating procedures for verifying digital proof. As a result, judicial processes often lack efficiency and risk generating inequities for parties without sufficient technical expertise or resources.

From this analysis, it is evident that challenges to electronic evidence in Indonesian courts extend beyond normative regulation and encompass technical, epistemological, and cultural dimensions. In line with Rawls' theory of procedural justice, deficiencies in electronic evidence may obstruct the realization of fair trials, as access to justice becomes unequal between parties with technological resources and those without. Therefore, reforming Indonesia's procedural law requires not only strengthening regulatory frameworks but also enhancing the capacity of legal actors, developing technological infrastructure, and fostering a cultural shift within the judiciary. Such efforts are essential to ensure that electronic evidence can genuinely contribute to a judicial system that is effective, modern, and just.

3. Critique of the Electronic Evidence Mechanism in Indonesia

Although the regulation of electronic evidence in Indonesian procedural law has advanced significantly through the recognition of electronic documents as admissible evidence under Law No. 11 of 2008 on Electronic Information and Transactions (ITE Law) and its reinforcement in Law No. 19 of 2016, the

mechanisms governing its application remain subject to fundamental criticism.

First, from the perspective of the theory of legal certainty, existing regulations remain fragmented and insufficiently integrated with both the Code of Criminal Procedure and the civil procedural codes (HIR/RBg). This situation creates uncertainty regarding the technical procedures for admitting and assessing electronic evidence, for instance, in the divergent judicial interpretations concerning the validity of electronic signatures or the authentication of digital data.

Second, in terms of the theory of justice, the mechanism of electronic evidence often fails to ensure equality of arms among litigating parties. Disparities in access to technology persist between law enforcement agencies, legal practitioners, and the public. Parties with advanced technological resources are more likely to present valid electronic evidence, while those with limited access are disadvantaged. Such inequality undermines the principle of fair trial.

Third, when analyzed through the lens of modern evidentiary theory, particularly the system of free evaluation of evidence (conviction intime) adopted in Indonesia's procedural law, judges are indeed granted discretion in assessing the probative value of electronic evidence. However, this discretion risks subjective evaluation in the absence of clear technical standards regarding the chain of custody, data integrity, and the validity of digital forensic methods. Consequently, electronic evidence may be manipulated or arbitrarily rejected, thereby weakening its role as an instrument of justice.

Fourth, from the perspective of progressive legal theory, electronic evidence in Indonesia remains overly legalistic and has not fully adapted to global technological developments. The regulatory framework tends to focus primarily on formal aspects, such as the validity of electronic signatures and digital certificates, while giving insufficient consideration to substantive approaches that seek material truth through emerging forms of evidence, such as big data, cloud storage, or social media content. This indicates the necessity of paradigm reform in procedural law to prevent stagnation in the face of technological innovation.

In sum, the principal criticisms of Indonesia's electronic evidence mechanism revolve around three key issues: (1) weak regulatory integration with existing procedural laws, (2) technological disparities that compromise equality before the court, and (3) the absence of technical standards ensuring objectivity and judicial accountability in the evaluation of electronic evidence. These critiques suggest that Indonesia's electronic evidentiary system remains in a transitional phase and requires reform at both the normative and practical levels to align with the principles of legal certainty, justice, and utility.

4. Reformulating the Policy of Electronic Evidence in Indonesia

The reformulation of Indonesia's electronic evidence policy has become an urgent necessity in light of the increasing complexity of digital transactions and the growing potential for legal disputes involving electronic evidence. At present, the legal framework for electronic evidence still relies on the Electronic Information and Transactions Law (Law No. 11 of 2008, as amended), Law No. 11 of 2012 on the Juvenile Criminal Justice

System (in certain criminal contexts), as well as the Code of Criminal Procedure (KUHAP) and the civil procedural codes (HIR/RBg), which have yet to fully anticipate the dynamics of technology-based evidentiary processes. Accordingly, reformulation should be directed towards strengthening normative, procedural, and technical aspects so that electronic evidence can be utilized optimally without compromising the principles of justice and legal certainty.

First, from the normative perspective, harmonization between the ITE Law and procedural laws is essential. At present, there exists disharmony regarding the legal status of electronic evidence. For example, Article 5(1) and (2) of the ITE Law recognizes information and electronic documents as valid evidence; however, in practice, judges often continue to refer to conventional categories of evidence under KUHAP and HIR. Reformulation is therefore needed to explicitly classify electronic evidence as a distinct type of evidence equal in standing to conventional forms, rather than merely an extension of written documents. Theoretically, this approach aligns with Eugen Ehrlich's theory of the development of law, which emphasizes that law must evolve in accordance with social realities, including the rise of digital technology.

Second, from the procedural perspective, policy reform must establish clear standards for the authentication, integrity, and originality of electronic evidence. To date, the greatest challenge lies in ensuring that digital data has not been manipulated. Thus, more detailed regulation is required concerning procedures for examination, storage, and validation of electronic evidence. In many international jurisdictions, such

as the Electronic Evidence Rules in the United States and Regulation (EU) No. 910/2014 (eIDAS) in the European Union, electronic evidence is admissible if it can be verified through encryption, digital signatures, and cybersecurity mechanisms. Indonesia could adopt similar practices by institutionalizing national standards for electronic evidence authentication through Supreme Court Regulations (Perma) or revisions to the ITE Law.

Third, from the technical and institutional perspective, reformulation should encourage the establishment of an independent National Digital Forensics Center. This institution would be responsible for verifying the authenticity of electronic evidence prior to its submission in court. Such an institution would relieve the evidentiary burden from litigating parties and ensure involvement of competent technical authorities. In theoretical terms, this corresponds with Lawrence Friedman's legal system theory, which underscores the importance of legal structures (institutions) in ensuring the effective functioning of law.

Fourth, reformulation must also take into account human rights protections, particularly the right to privacy and personal data protection. In practice, the collection of electronic evidence often involves surveillance, device searches, or the examination of personal data, all of which may infringe upon privacy rights. Therefore, reformulated policies must integrate the principles of due process of law and the proportionality test, ensuring that electronic evidence collection is lawful, limited in scope, and proportionate to the needs of the case. This approach resonates with A.V. Dicey's theory of the rule of law, which emphasizes the

supremacy of law and the protection of individual rights against state arbitrariness.

Fifth, in the context of long-term reform, Indonesia should consider enacting a standalone Electronic Evidence Law. Such legislation would address regulatory fragmentation and provide a more comprehensive and binding framework for judges, prosecutors, lawyers, and other law enforcement actors. The law could regulate in detail matters such as the definition of electronic evidence, procedures of examination, authentication mechanisms, the role of digital forensic experts, and dispute resolution regarding the validity of electronic evidence. This would allow Indonesia's legal framework to keep pace with global technological developments while providing greater legal certainty.

Through such comprehensive reformulation, Indonesia's system of electronic evidence is expected not only to be responsive to the challenges of digital technology, but also to uphold the principles of justice, legal certainty, and utility. Reformulation thus provides a practical solution to the dilemma faced by courts: how to balance efficiency in judicial proceedings with the protection of parties' rights.

5. Comparative Analysis of Electronic Evidence Systems: Indonesia, the United States, Singapore, and the European Union

In the context of electronic evidence in judicial proceedings, Indonesia continues to face both normative and technical limitations when compared with jurisdictions that have more advanced digital legal systems. For instance, in the United States, regulations on Electronic Discovery (E-Discovery) have

evolved significantly through the Federal Rules of Civil Procedure (FRCP). These rules provide systematic mechanisms for the collection, preservation, and examination of digital evidence, including the application of metadata analysis to safeguard the authenticity of electronic documents. This stands in contrast to Indonesia, where electronic evidence is merely recognized under the Electronic Information and Transactions Law (ITE Law), without detailed provisions on digital forensic procedures in the courtroom.

By contrast, Singapore has developed a progressive regulatory framework under its Evidence Act, which explicitly recognizes the validity of electronic documents and digital transactions. This framework is further supported by the establishment of a specialized Technology Court equipped with advanced facilities to adjudicate technology-related disputes. Such integration between legal regulation and institutional infrastructure illustrates a high degree of readiness. In Indonesia, however, despite formal recognition of electronic evidence, challenges persist in practice, including the shortage of qualified digital forensic experts, the absence of uniform operational standards for electronic evidence, and judicial reluctance in assessing the validity of such evidence.

Similarly, the European Union, through Regulation (EU) No 910/2014 on electronic identification and trust services (eIDAS Regulation), provides a clear standard on electronic signatures, digital certificates, and the validity of electronic documents across member states. This regulation offers stronger legal certainty in evidentiary processes, particularly in the context of cross-border litigation. In contrast, Indonesia still lacks a

nationally standardized and internationally recognized digital certification system, which often hinders the admissibility of foreign electronic evidence within its domestic legal framework.

This comparative analysis demonstrates that Indonesia must reformulate its regulatory framework for electronic evidence by not only strengthening the normative foundations within KUHAP and the ITE Law, but also by developing detailed technical mechanisms akin to those applied in the United States, Singapore, and the European Union. Such reforms would enable Indonesia's evidentiary system to operate in a more transparent, accountable, and globally aligned manner, while ensuring that its judiciary keeps pace with the demands of the digital legal era.

Conclusion

Based on the foregoing discussion of the challenges and reformulation of electronic evidence in Indonesian courts, it can be concluded that although Indonesia has established a relatively clear legal foundation through the Electronic Information and Transactions Law (ITE Law) and the Criminal Procedure Code (KUHAP), the practical implementation of electronic evidence remains problematic. Key challenges include issues of validity, authenticity, and integrity of electronic evidence, compounded by technical limitations, insufficient digital forensic infrastructure, and inadequate capacity among judicial actors. These deficiencies create a significant gap between normative provisions and courtroom practice. Furthermore, the absence of uniform standards for the examination of electronic evidence has resulted in legal uncertainty and the risk of inconsistent judicial decisions. Compared to jurisdictions such as the United States and

Singapore, Indonesia remains behind in adopting forensic technologies, strengthening evidentiary standards, and developing technical guidelines for judges and law enforcement authorities.

Accordingly, several recommendations can be proposed to enhance the effectiveness and legitimacy of electronic evidence in Indonesia's judicial system. First, a comprehensive regulatory framework should be established, either through a dedicated statute or a Supreme Court Regulation (Perma), to govern the admissibility, examination, and assessment of electronic evidence under uniform standards. Second, the government and judiciary should prioritize capacity building by providing systematic training in digital forensics and legal technology literacy for judges, prosecutors, and law enforcement officers. Third, investment in digital forensic laboratories must be advanced to ensure that the verification of electronic evidence can be conducted with scientific accuracy and accountability. Fourth, international cooperation should be fostered to facilitate knowledge exchange, adoption of best practices, and harmonization of cross-border evidentiary standards to address transnational technology-related disputes.

Through these measures, the Indonesian electronic evidence system is expected to operate more effectively, transparently, and accountably, while also ensuring its adaptability to the demands of the digital era. Such reforms would not only strengthen the rule of law domestically but also align Indonesia's judicial framework with global standards of electronic evidence.

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