

Digital Transformation of Criminal Justice in Indonesia: Urgency and Challenges of Implementation

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Abstract

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The Industrial Revolution 4.0 and Society 5.0 have driven major transformations in various aspects of life, including the legal field. Indonesia, through its criminal procedure system which remains traditional as regulated in the Indonesian Criminal Code (KUHP/*Kitab Undang-Undang Hukum Pidana*) faces fundamental issues such as lengthy bureaucracy, corruption practices, delayed processes, and limited public access to justice. The modernization of criminal justice has become an urgent need to realize the principles of good governance that emphasize transparency, accountability, and efficiency. Digitalization efforts have been implemented through the application of e-court, e-litigation, virtual hearings, as well as the utilization of technologies such as Artificial Intelligence (AI), blockchain, digital signatures, and electronic evidence management. This research employs a normative juridical method with a literature and statutory approach. The findings indicate that the digitalization of criminal justice brings significant benefits in terms of efficiency, transparency, and accessibility, but at the same time faces serious challenges including limited infrastructure, low digital literacy, and data security threats. Therefore, the strategy for developing digital justice must be integrated, adaptive, and ensure the protection of human rights.

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1. Introduction

The Industrial Revolution 4.0 and Society 5.0 have brought about fundamental changes in the dynamics of global life. The Industrial Revolution 4.0 emphasizes automation, the integration of digital technology, and the use of Artificial Intelligence (AI) in various aspects of life, while Society 5.0 is oriented towards using technology to improve human quality of life and solve social problems sustainably. This transformation not only has implications for the industrial and economic sectors but also extends to the legal sphere, which has a vital role in ensuring justice, legal certainty, and the protection of human rights.¹

In the legal context, digitalization has become a global trend that offers both opportunities and challenges. The use of information technology in the legal system can enhance efficiency, transparency, and accessibility. Various countries have begun to develop digital justice systems, for example, the use of e-filing, online hearings, and AI-based legal analysis. However, this development also raises new issues such as data privacy, cybersecurity, and the need to update regulations to accommodate digital forms of evidence and technology-based decisions.

Indonesia, with its criminal procedure system still based on the Criminal Procedure Code (KUHAP), faces limitations in dealing with these technological developments. The KUHAP essentially functions to ensure legal certainty and the protection of human rights in criminal proceedings, from the investigation stage to the execution of judgments. However, its implementation is often hampered by

¹ Lottie Lane. "Clarifying human rights standards through artificial intelligence initiatives." *International & Comparative Law Quarterly* 71, no. 4 (2022): 915-944.

classic problems, such as lengthy bureaucracy, slow case administration, the potential for corruption, delays in the judicial process, and limited access for people seeking justice, especially in remote areas.

This situation emphasizes the urgency of modernizing the criminal procedure system to align with the principles of good governance, namely transparency, accountability, and efficiency.² Efforts toward digitalization have actually been made, for example through the implementation of e-court since 2018 by the Supreme Court, which allows for electronic case registration, payment of case fees, and communication between parties. The COVID-19 pandemic accelerated the adoption of e-litigation and virtual hearings, which allowed defendants, witnesses, and experts to provide testimony without having to be physically present in the courtroom.

In addition, innovations have also emerged in the use of advanced technologies, such as the use of AI for legal document analysis and decision prediction, blockchain for data security, digital signatures for legal document authentication, and electronic evidence management systems that support the process of proof, especially in cybercrimes. These innovations prove that digitalization can increase administrative efficiency, strengthen transparency, expand accessibility, and reduce operational costs in the criminal procedure process.

Nevertheless, the implementation of digitalization in criminal justice is not without various challenges. First, the limited information technology infrastructure

² Junaedi Junaedi. "Efforts to prevent bureaucratic corruption based on the piercing principles of the governance veil in realizing good governance and clean governance in Indonesia." *Journal La Sociale* 1, no. 2 (2020): 10-16.

in some regions remains a major obstacle. Second, low digital literacy among law enforcement officials creates difficulties in operating technology-based justice systems. Third, data security is a critical issue because information related to legal cases is highly vulnerable to hacking and misuse. In addition, technological developments also demand regulatory updates to suit the needs of modern legal practice.

The novelty of this research lies in its comprehensive analysis of the importance of digitalizing criminal justice in Indonesia, which not only focuses on opportunities but also examines the challenges and implementation strategies. By using a normative juridical approach, this research seeks to answer several main questions: why is the digitalization of criminal justice important in Indonesia, what are its benefits and challenges, and what is the most appropriate strategy to realize an effective, efficient, and just criminal procedure system in the digital era.

2. Literature Review

The literature on the digitalization of law and criminal justice shows that the development of the Industrial Revolution 4.0 and Society 5.0 has brought major consequences for legal systems in various countries. Some studies emphasize that digitalization is not just an option but a necessity to improve the effectiveness and efficiency of judicial institutions. The concept of Society 5.0, which emphasizes the use of digital technology for human well-being, provides a philosophical foundation for the digitalization of justice in Indonesia. This is in line with the view of Bhatt et

al. (2024),³ regarding the Industrial Revolution 4.0 which emphasizes the integration of technology in all aspects of life, including the legal system which was previously synonymous with manual processes and lengthy bureaucracy.

In the Indonesian context, legal literature shows that the KUHAP as the legal basis for criminal procedure still has traditional characteristics. According to Setyadi and Masyhar,⁴ the KUHAP was designed to provide legal certainty and the protection of human rights, but in practice it is often constrained by limited resources, low professionalism of law enforcement officials, and convoluted bureaucracy. Research conducted by Efendi and Sukasih,⁵ highlights that the criminal justice process in Indonesia is still vulnerable to corrupt practices, delayed case resolution, and limited public access to justice.

Efforts to modernize the law in Indonesia are marked by the birth of the e-court program introduced by the Supreme Court since 2018. A study conducted by Zulaeha,⁶ shows that the implementation of e-court and e-litigation is able to increase the efficiency of case administration and minimize direct contact between parties, thus being more transparent and accountable. The COVID-19 pandemic further accelerated the adoption of digitalization, where virtual hearings became an

³ Hitesh Bhatt, Rajesh Bahuguna, Siddharth Swami, Rajesh Singh, Anita Gehlot, Shaik Vaseem Akram, Lovi Raj Gupta, Amit Kumar Thakur, Neeraj Priyadarshi, and Bhakisipho Twala. "Integrating industry 4.0 technologies for the administration of courts and justice dispensation a systematic review." *Humanities and Social Sciences Communications* 11, no. 1 (2024): 1-16.

⁴ Simon Butt and Tim Lindsey. "The Criminal Procedure Code." In *Crime and Punishment in Indonesia*, pp. 44-69. Routledge, 2020.

⁵ Razif Arfan Efendi, and Arfianita Sukasih. "Assessing the Effectiveness of Indonesia's Criminal Justice System in Combatting Corruption: A Juridical Analysis." *Law and Economics* 18, no. 2 (2024): 110-121.

⁶ Mulyani Zulaeha. "E-Courts in Indonesia: Exploring the opportunities and challenges for justice and advancement to judicial efficiency." *International Journal of Criminal Justice Sciences* 18, no. 1 (2023): 183-194.

important instrument in maintaining the continuity of legal proceedings without having to physically present the relevant parties in the courtroom.

International studies also provide an overview of the use of advanced technology in the justice system. For example, in China and Estonia, blockchain technology is used for case data storage and security, while in the United States, the use of AI in analyzing legal documents has been tested to improve decision prediction. This is that the court of the future will be increasingly technology-based, both in administration and in the substance of the trial.

However, the literature also warns of the major challenges that accompany the digitalization of law. According to Pitaloka,⁷ the limited technological infrastructure in remote areas, the low digital literacy of law enforcement officials, and the threat of data security are serious obstacles to the implementation of digital justice in Indonesia. Based on the literature review, it can be concluded that the digitalization of criminal justice in Indonesia is a need that cannot be postponed. However, the success of its implementation is highly determined by the readiness of regulations, technological infrastructure, human resources, and the commitment of the government and judicial institutions to build a modern, transparent, and just legal system.

⁷ Diva Pitaloka. "E-court: A digital disruption in law enforcement and its impact on judicial efficiency in Indonesia." *Ex Aequo et Bono JL* 2 (2024): 82-95.

3. Method

This research uses a normative juridical method that focuses on legal studies from a normative perspective through an analysis of laws and regulations, legal doctrine, and relevant literature. The normative juridical approach was chosen because the main issue discussed in this research is the urgency of building a digital-based criminal justice system in Indonesia, which is closely related to regulatory developments and the application of criminal procedure legal norms in the context of technology-based modernization. This method allows for research to be conducted by examining the applicable positive legal norms and linking them to legal theories and the implementation practices of digitalization of justice in various countries as a comparison.

In this study, the main data sources were obtained through primary legal materials in the form of relevant laws and regulations, such as the Criminal Procedure Code (KUHP), the Law on Information and Electronic Transactions (ITE), the Law on Personal Data Protection, and Supreme Court regulations governing the e-court and e-litigation systems. In addition, secondary legal materials in the form of scientific literature, journal articles, previous research results, and the views of legal experts are used as references to strengthen the analysis of the actual conditions of the digitalization of the criminal justice system in Indonesia. Tertiary legal materials such as legal dictionaries, legal encyclopedias, and credible online sources are also used to provide conceptual and contextual understanding.

The analysis was carried out by examining and interpreting the applicable legal provisions, then connecting them with the practices and phenomena of the

digitalization of criminal justice. This method emphasizes a conceptual and systematic study of the urgency, benefits, and challenges of implementing a digital-based criminal justice system. In addition, a comparative approach is also used to see how other countries apply digitalization in their legal systems, so that it can provide relevant input for the development of the criminal procedure system in Indonesia.

The research process begins with the collection of legal materials through a literature study, followed by the processing of legal data through the interpretation and systematization of norms related to the digitalization of criminal justice. Furthermore, a normative analysis is carried out on the suitability of the applicable regulations with the practical needs of digitalization, as well as the identification of existing regulatory gaps. The results of this analysis are then arranged argumentatively to show why the development of a digital-based criminal justice system is an urgent need in Indonesia, and how legal strategies can be formulated to answer the implementation challenges.

Thus, this normative juridical method not only provides a theoretical understanding of the legal position in the digitalization of criminal justice but also offers an analytical framework for formulating strategic recommendations that can strengthen the criminal justice system in Indonesia to be more responsive to global technological developments while remaining based on the principles of justice and the protection of human rights.

4. Results

4.1. The Urgency of Building a Digital-Based Criminal Justice System in Indonesia

The development of a digital-based criminal justice system in Indonesia has a very high urgency in line with the developments of the Industrial Revolution 4.0 and Society 5.0, which demand the use of technology in various sectors of life. In a global framework, many countries have digitalized their justice systems, both in the form of e-courts, virtual hearings, and the use of artificial intelligence to support the legal administration process. Indonesia, as a country with a complex judicial system and a high number of criminal cases, cannot close itself off from this current of change. Digitalization is not just an option, but a necessity to answer the classic problems in criminal law enforcement.⁸

One of the main reasons for the urgency of digitalization is the long and convoluted bureaucracy that often slows down the resolution of criminal cases. Manual administrative processes that require physical documents not only hinder efficiency but also open up space for corrupt practices and manipulation. With a digital-based system, case registration, document submission, and even hearing notifications can be done online with a digital footprint that can be monitored by the public. This supports the principles of good governance in the legal system, namely transparency, accountability, and efficiency.⁹

⁸ Cecep Prayatno, Mohamad Tohari, and Tri Susilowati. "The Impact Of Using Technology And Innovation In Law Enforcement In The Era Of Digitalization." *Jurnal Ekonomi Teknologi dan Bisnis (JETBIS)* 3, no. 8 (2024): 1026-1033.

⁹ Didier Yangonzela Liambomba. "The right of access to public information: human rights issues, transparency and good governance." *Constitutionale* 4, no. 1 (2023): 1-28.

Another urgency lies in the limited public access to justice. In Indonesia, geographical disparities are a major challenge because many defendants or witnesses in remote areas have difficulty attending trials. Digitalization, especially through virtual hearings, can be a solution to overcome these geographical obstacles. Thus, the public can get access to justice that is faster, cheaper, and more equal without having to face the obstacles of transportation costs and distance.

In addition, the COVID-19 pandemic became an important momentum that showed the urgent need for a digital-based justice system. The implementation of online hearings during the pandemic showed that digitalization is not just a futuristic idea but a necessity to maintain the continuity of legal processes in emergency situations. This provides a lesson that technology can be used not only to support efficiency but also to ensure the continuity of judicial functions in a crisis.

Digitalization also supports the aspect of human rights protection. Through a digital system, oversight of the legal process can be more transparent because every step can be documented in the form of electronic data. With a digital footprint, the potential for procedural violations or abuse of power by law enforcement officials can be minimized. This is in line with the goal of the KUHAP to provide legal certainty and protection of rights for defendants and victims, although in practice the still-traditional KUHAP has not fully answered the challenges of the digital era.

The urgency of building a digital-based criminal justice system is also related to the need for legal harmonization with global developments. Countries like Singapore and China have built a solid digital legal infrastructure. If Indonesia does not immediately adapt, there will be a legal gap and the potential for being left behind

in global competition, especially regarding the standards of justice and the protection of citizens' rights. Therefore, the modernization of the criminal justice system through digitalization is an urgent need that cannot be postponed.

With these various urgencies, it can be affirmed that the digitalization of the criminal justice system in Indonesia is not only for the benefit of internal efficiency but also as an effort to transform into a modern, inclusive, and just legal system. The implementation of digitalization is an important foundation to ensure that Indonesia's criminal justice can answer the challenges of the times while guaranteeing the upholding of the principles of justice for all citizens.

4.2. Challenges and Strategies for Implementing Digitalization of Criminal Justice in Indonesia

Although the digitalization of the criminal justice system in Indonesia has a high urgency, its implementation is not free from various complex challenges. The first challenge is the gap in information and communication technology infrastructure. Not all regions in Indonesia have adequate internet access, especially remote areas with limited networks. This hinders the implementation of virtual hearings or digital administrative systems that require stable connectivity. Without equitable infrastructure, digitalization risks creating inequality in access to justice.

The second challenge is the low digital literacy of law enforcement officials. Judges, prosecutors, police, and lawyers do not all have adequate skills in using digital technology. This condition can hinder the smooth process of digitalizing criminal justice. In fact, a digital-based system demands technical expertise in operating legal

applications, understanding data security, and maintaining the integrity of electronic documents.¹⁰

The regulatory aspect is also a serious obstacle. The KUHAP as the legal basis for criminal procedure is still very traditional and does not comprehensively regulate digital evidence, electronic signatures, or the use of AI in justice. This regulatory lag means that digitalization practices often run without a strong legal umbrella, which has the potential to cause legal uncertainty. For example, the legal status of online hearing recordings or electronic documents in criminal evidence still causes debate.

Data security and the risk of misuse must also be considered. Digitalization opens up the potential for hacking, information leaks, and manipulation of case data. Given that criminal cases often involve sensitive data, cybersecurity protection is non-negotiable. Without a strong security system, public trust in digital justice will decline.

To face these various challenges, a comprehensive strategy is needed. First, the government must accelerate the equitable development of digital infrastructure throughout Indonesia so that virtual hearings and online-based legal administration can be accessed equally. Second, increasing the capacity of human resources through digital literacy training for law enforcement officials is a key factor. Mastery of technology will determine the success of the implementation of the digital system.

Third, the legal regulation of criminal procedure must be updated immediately. The KUHAP needs to be revised to be in line with digital

¹⁰ Ferdi Yufriadi, Fadilla Syahriani, and Abdullah A. Afifi. "Trade transformation in the digital era: Agency role, opportunities and challenges." *AL-IMAM: Journal on Islamic Studies, Civilization and Learning Societies* 5, no. 1 (2024): 13-23.

developments, including regulations regarding the validity of electronic evidence, the use of digital signatures, and the use of artificial intelligence technology to support legal administration. In addition, synergy with the ITE Law and the Personal Data Protection Law needs to be strengthened to create regulatory harmonization.

Fourth, strengthening cybersecurity systems must be a priority. The Supreme Court together with the government needs to build a technology system that is not only efficient but also has a strict data protection layer. The use of blockchain as a recording system that is difficult to manipulate can be one option to ensure the integrity of case data.

With this strategy, the digitalization of criminal justice can be carried out effectively and sustainably. The existing challenges are not absolute obstacles but rather a driving force to build a more modern and responsive legal system. If this strategy is implemented consistently, Indonesia will be able to have a digital-based criminal justice system that is not only efficient but also upholds the principles of justice, human rights protection, and public trust.

5. Discussion

The digitalization of the criminal justice system in Indonesia is an important phenomenon that is not only related to technological progress but also to efforts to realize the principles of good governance in law. The results of previous research show that there is a great urgency to carry out digitalization, as well as serious challenges in its application. Therefore, this discussion focuses on how digitalization

can change the paradigm of criminal justice and the strategies that need to be taken so that its implementation is effective and sustainable.

First, digitalization provides a great opportunity to increase the efficiency of criminal justice. With the e-court and e-litigation systems, the case administration process becomes faster, cheaper, and more transparent.¹¹ This reduces lengthy bureaucracy and minimizes physical interaction that is prone to corruption. The experience during the COVID-19 pandemic showed that online hearings can run well even with limitations, proving that digitalization is no longer just a futuristic idea but a real need. However, the implementation of digitalization is still partial and not comprehensive, so institutional strengthening is needed so that technology truly becomes an integral part of the legal system.

Second, the aspect of substantive justice also has an impact from digitalization. The use of technology such as digital recordings of trials, electronic signatures, and electronic evidence can strengthen the principle of due process of law. The transparency of the legal process becomes higher because every stage is documented digitally and can be audited. This has the potential to strengthen the protection of the rights of both defendants and victims.

Third, the challenge related to the digital literacy of law enforcement officials cannot be ignored. Digitalization is not just about presenting applications but requires an adaptation of legal culture. Judges, prosecutors, lawyers, and police are required not only to understand the law but also to master information technology.

¹¹ Muhamad Latif and Ar-Rahiim Innash. "Digital Transformation In The Justice System: Enhancing Efficiency And Accessibility Of Legal Services." *JIL: Journal of Indonesian Law* 5, no. 2 (2024): 179-198.

If this literacy gap is not addressed immediately, digitalization can actually create new injustices because parties who do not master the technology will have difficulty following digital procedures. Therefore, human resource capacity building is a key factor in the success of digital transformation in criminal law.

Fourth, the issue of data security and privacy protection is a crucial aspect. Criminal case data is sensitive information that concerns the dignity of defendants, victims, and witnesses. Data leaks can cause great losses, including defamation and further criminalization. Therefore, the digital justice system must be built on a strong cybersecurity foundation, with encryption technology, two-factor authentication, and the use of blockchain to ensure the integrity of case data. Without it, public trust in digital justice will be fragile.

This discussion also affirms that digitalization cannot be seen only as a modernization of technology but as a national legal development strategy. Digitalization must be placed in a large framework of legal reform that emphasizes transparency, accountability, efficiency, and the protection of human rights. Thus, the digitalization of criminal justice does not stop at the administrative level but is able to build a legal system that is more just and in accordance with the demands of the global era.

Finally, the digitalization of the criminal justice system in Indonesia must be understood as a transformative process that requires political commitment, regulatory reform, increased human resource capacity, and infrastructure development. The success of digitalization is not only determined by technological

readiness but also by the extent to which legal actors can adapt to the changing paradigm towards a modern, inclusive, and sustainable legal system.

6. Conclusion

The digitalization of the criminal justice system in Indonesia is an inevitable necessity that cannot be postponed, especially in facing the challenges of the Industrial Revolution 4.0 and Society 5.0. The urgency of building a digital-based justice system lies in the need to overcome classic problems such as long bureaucracy, corrupt practices, delayed case resolution, and limited public access to justice. The presence of e-court, e-litigation, and virtual hearings during the COVID-19 pandemic has proven that technology can be an effective instrument in supporting the efficiency, transparency, and accountability of the criminal justice system.

However, the implementation of digitalization is not free from various challenges. The digital infrastructure gap, low digital literacy of law enforcement officials, regulatory delays, and data security issues are serious obstacles that must be addressed immediately. Therefore, the strategy for building a digital justice system must include accelerating the equitable distribution of technology infrastructure, increasing human resource capacity through digital literacy training, reforming criminal procedure regulations to be in line with technological developments, and strengthening cybersecurity systems that can protect case data to the maximum extent.

With this strategy, digitalization will not only result in administrative efficiency but also provide stronger human rights protection, increase public trust, and realize a criminal justice system that is more inclusive and modern. In the end, digitalization must be understood not just as a technical transformation but as an integral part of national legal reform to build a more just, transparent, and responsive Indonesian criminal justice

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