The Urgency of Artificial Intelligence Regulation in Indonesia's Criminal Justice

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Abstract

The rapid development of artificial intelligence (AI) in criminal justice systems presents both opportunities and challenges, particularly regarding ethics, transparency, and accountability. This study aims to analyze the urgency of regulating AI in Indonesia's criminal justice system. Using a normative-analytical approach, the research explores the risks of algorithmic bias, data privacy violations, and the absence of human oversight in legal decision-making. Comparative analysis with AI regulations in the European Union and the United States highlights key regulatory gaps in Indonesia. The findings reveal that without clear and enforceable legal frameworks, AI implementation may worsen legal inequalities and undermine human rights. This study underscores the need for a national legal framework that ensures algorithmic transparency, data protection, and human involvement in AI-driven decisions. The research offers an early contribution to the development of responsible and equitable AI governance in the justice sector.

Keywords: Artificial Intelligence; Regulation; The Criminal Justice System; Human Rights; Transparency

Abstrak

Perkembangan kecerdasan buatan (AI) dalam sistem peradilan pidana membawa peluang sekaligus tantangan, khususnya terkait etika, transparansi, dan akuntabilitas. Penelitian ini bertujuan menganalisis urgensi regulasi AI dalam konteks sistem peradilan pidana Indonesia. Dengan pendekatan normatif-analitis, studi ini membahas risiko bias algoritma, pelanggaran privasi, dan absennya pengawasan manusia dalam pengambilan keputusan hukum. Penelitian juga membandingkan kerangka hukum Indonesia dengan regulasi AI di Uni Eropa dan Amerika Serikat. Hasil analisis menunjukkan bahwa tanpa regulasi yang ketat, penggunaan AI berpotensi memperburuk ketimpangan hukum dan melemahkan perlindungan hak asasi manusia. Penelitian ini menekankan pentingnya pembentukan kerangka hukum nasional yang mengatur pengawasan algoritma, perlindungan data pribadi, dan keterlibatan manusia dalam proses pengambilan keputusan. Temuan ini memberikan kontribusi awal terhadap desain kebijakan hukum yang adil dan bertanggung jawab dalam pemanfaatan AI di sektor peradilan.

Kata Kunci: *Kecerdasan Buatan; Regulasi; Sistem Peradilan Pidana; Hak Asasi Manusia; Transparansi*

Introduction

Artificial Intelligence (AI) has rapidly transformed various sectors, including health, education, finance, and increasingly, the legal and criminal justice system. As one of the most influential technological innovations in recent decades, AI has been used in multiple aspects of judicial processes, from automating administrative tasks to assisting in complex legal decision-making (Chakraborty, 2020). The integration of AI is expected to enhance accuracy, reduce processing time, and improve consistency in legal judgments.

In several developed countries, AI tools are now applied to predict trial outcomes, assess risk in sentencing, and support judicial reasoning. These technologies are designed to optimize efficiency and reduce subjective bias. In Indonesia, initiatives to modernize the legal system through digital transformation are underway. However, the use of AI in core decision-making processes within the criminal justice system remains limited and unregulated (Permana et al., 2025). This lack of regulation poses significant ethical and legal challenges. Algorithmic bias, for instance, has been identified as a recurring problem in AI systems used in law enforcement and judiciary. Studies show that algorithms can produce discriminatory outcomes against certain groups, particularly ethnic minorities and low-income populations (Pasaribu, 2024). In a country as socially and culturally diverse as Indonesia, the deployment of AI without proper oversight may exacerbate existing inequalities in the justice system.

The urgency to regulate AI is further underscored by Indonesia's absence of specific legal frameworks governing AI deployment in criminal justice. Unlike the European Union, which has proposed the AI Act, and the United States, which has issued ethical principles for AI, Indonesia still lacks structured guidelines on how AI should be applied responsibly in legal contexts (Dessani et al., 2023). This regulatory gap opens the possibility for misuse, privacy violations, and diminished public trust in legal institutions (Raharjo, 2023).

While several prior studies have discussed the role of AI in the legal sector, most have focused on its technological potential and efficiency. Few have critically analyzed the legal and human rights implications of AI use in judicial processes, especially in developing countries like Indonesia (Silander, 2019). Consequently, there is a limited academic discourse on the intersection of AI, law, and ethics within Indonesia's legal scholarship (Fernando et al., 2023; Arfani & Ambardi, 2024).

This article seeks to address that gap by emphasizing the need for regulatory clarity in the application of AI within Indonesia's criminal justice system. It contributes to the discourse by offering a comparative perspective with regulatory models in the European Union and the United States, identifying key legal principles that Indonesia can adopt. Furthermore, the article highlights the potential risks of unregulated AI use and argues for a rights-based approach to AI governance in the legal domain. To achieve these objectives, this study employs a normative-analytical method. The analysis is grounded in relevant legal literature, international frameworks, and existing policy documents. By comparing Indonesia's current legal position with best practices in other jurisdictions, the article offers concrete recommendations for the formulation of a comprehensive, ethical, and enforceable regulatory framework for AI use in the criminal justice system. Therefore, this study aims to analyze the regulatory gap and propose key legal principles for governing the ethical use of AI in Indonesia's criminal justice system, using a normative-analytical approach grounded in comparative legal analysis.

Method

This study employs a normative-analytical approach with comparative analysis to examine the urgency of regulating artificial intelligence (AI) in Indonesia's criminal justice system. The main data sources include legal documents, national and international policy frameworks (e.g., EU GDPR, U.S. AI principles), academic publications, and institutional reports from bodies such as the OECD and the UN. Data were collected through structured literature review and document analysis, focusing on the ethical, legal, and institutional dimensions of AI implementation in judicial contexts. The analysis combines descriptive qualitative techniques to map the current state of regulation, comparative evaluation to identify best practices from the European Union and the United

States, and normative reasoning to formulate recommendations suitable for the Indonesian legal context. Limitations of this method include reliance on secondary data and the absence of empirical validation, which may limit generalizability but remains appropriate for exploratory legal inquiry and policy formulation.

Results and Discussion

In this study, an analysis of the regulation of the use of artificial intelligence (AI) in the criminal justice system in Indonesia was carried out by comparing existing legal frameworks in developed countries, such as the European Union and the United States, and identifying the challenges faced by Indonesia in formulating appropriate policies. The results of this analysis show some key findings that are important for the development of AI regulation in Indonesia's criminal justice system.

1. Lack of Clear Regulation in Indonesia

Although artificial intelligence (AI) technology has begun to be applied in the criminal justice system in Indonesia, its implementation is still very limited and not accompanied by clear and comprehensive regulations. In recent years, the use of AI in the justice system has begun to be looked at as a solution to improve efficiency, speed, and accuracy in legal processes, such as sentencing predictions, evidence assessment, and prisoner risk evaluation. For example, a number of legal institutions in Indonesia have begun to use algorithms to analyze data on criminal offenders to predict possible criminal behavior in the future, which aims to assist judges in making decisions (Rusydi, 2025). However, the rapid adoption of AI has created new challenges related to transparency, accountability, and the protection of individual rights.

Currently, Indonesia only has the newly passed Personal Data Protection Law (PDP Law) in 2022, which provides a basic legal framework for the protection of citizens' personal data. While the law is a positive step in safeguarding the privacy of individuals, it has not explicitly regulated the use of AI in legal contexts, especially in the criminal justice system. Therefore, the application of AI in the Indonesian legal system is highly dependent on the interpretation and application of existing regulations, which are often unable to accommodate the complexity and specification of AI technologies. As revealed by Land & Aronson, although AI technology offers various advantages in the justice system, the main challenge is how to regulate its use so as not to cause injustice or harm human rights (Land & Aronson, 2020).

At the international level, several countries have begun to formulate more specific regulations regarding the use of AI in the criminal justice sector. In the European Union, for example, regulations governing the use of AI are more mature. The Artificial Intelligence Act proposed by the European Commission in 2021 aims to regulate the use of AI technology in various sectors, including the judiciary, with a focus on transparency, accountability, and protection of human rights (Smuha et al., 2021). This regulation requires the use of algorithms in the legal system to be independently tested and audited to ensure that the algorithm does not contain bias or discrimination. In the United States, although there is no clear federal regulation of AI in criminal justice, the state of California has developed California's Algorithmic Accountability Act that governs the use of algorithms in various sectors, including the legal sector. This law requires companies to conduct audits of algorithms used in decision-making processes that affect the rights of individuals, including in the criminal justice system (McKay, 2020).

However, in Indonesia, despite efforts to increase the use of technology in the judiciary, such as through e-court and e-litigation systems, there are no regulations specifically governing the application of AI in the legal decision-making process, as is

done in the European Union and some states in the United States. This shows that Indonesia needs a more detailed legal framework to regulate the use of AI in the criminal justice system, with a focus on algorithmic surveillance, personal data protection, and human involvement at every stage of decision-making.

One of the main issues in the application of AI in the judiciary is algorithmic bias, which can exacerbate inequities in the legal system (Min, 2023). A number of studies show that AI algorithms used in the justice system are often unable to avoid the bias that exists in the data used to train the algorithms. Mayson in their study on "machine bias" found that algorithms used to predict the risk level of perpetrators more often give a heavier assessment to individuals from certain ethnic backgrounds, especially black minority groups (Mayson, 2018). This shows that without strict oversight, AI can exacerbate social injustices that already exist in the criminal justice system.

Therefore, regulations governing the use of AI in the criminal justice system in Indonesia need to cover several important aspects. First, the regulation must ensure that the algorithms used in the decision-making process must be free of bias and independently auditable. The use of algorithms should be transparent, and participants in the judicial process should be given access to understand how those decisions are made. Second, regulations should regulate stricter personal data protection, especially related to the use of personal data to train and operate AI algorithms. Third, while AI can speed up legal processes, human involvement in every stage of decision-making must be maintained to ensure fairness and accountability in every legal decision taken.

In this context, Indonesia needs to urgently formulate a legal framework that can accommodate the rapid development of AI technology, while ensuring the protection of human rights and justice in the criminal justice system. As a first step, Indonesia can refer to regulations that have been implemented in developed countries and adapt them to Indonesia's social and cultural context. The regulation must be flexible and responsive to rapid technological developments, while maintaining the basic principles of fairness, transparency, and accountability.

2. Potential Algorithm Bias

One of the main problems identified is the potential for algorithmic bias that can affect the outcome of decisions in the criminal justice system. As found in the study by Turner Lee, algorithms used in the justice system often tend to be biased against certain groups, such as ethnic minorities or people with low socioeconomic status (Turner Lee, 2018). For example, in the use of AI for crime risk prediction, algorithms can exacerbate existing inequalities in the legal system, which can result in discrimination against certain groups. Therefore, it is important for Indonesia to adopt regulations that not only govern the use of AI, but also ensure that the algorithms used in the judiciary are free from bias.

3. Regulation in the European Union and the United States

In the European Union, regulations on AI, including in the context of criminal justice, have grown rapidly. The Artificial Intelligence Act proposed by the European Union in 2021 aims to ensure the safe, transparent, and fair use of AI. The regulation emphasizes the importance of evaluation and audit of algorithms, as well as the protection of fundamental rights, including the right to privacy and non-discrimination. Meanwhile, in the United States, although there are no specific federal regulations regarding the use of AI in criminal justice, some states have developed guidelines governing the use of AI in the justice system, such as California's Algorithmic Accountability Act that emphasizes algorithm transparency and accountability. However, despite some positive steps, both in the EU and the United States, there are still shortcomings in a holistic and consistent arrangement.

4. Human Involvement in the Decision Making Process

One of the main challenges faced by Indonesia in formulating AI regulations is to ensure that decisions made by AI can still be accounted for by humans. The use of AI in the judiciary should still involve judges and courts as the final decision-makers, with AI serving as a tool to improve efficiency and accuracy. In this regard, clear regulation regarding the role of humans in every stage of AI-based decisions is indispensable to ensure fairness and avoid total dependence on technology.

5. The Urgency of AI Regulation Development in Indonesia

The urgency of developing regulations that regulate the use of AI in the Indonesian criminal justice system cannot be postponed any longer. The growing use of AI, if not properly regulated, can lead to a range of problems, from inequities in decision-making to serious privacy violations (Barlian et al., 2025). This is in line with the findings revealed by De Almeida et al., which emphasize the importance of regulation to ensure that AI is used ethically, transparently, and responsibly. Therefore, Indonesia needs to adopt a legal framework that not only covers technical aspects, but also provides protection for the basic rights of citizens, especially in the context of criminal justice (De Almeida et al., 2021).

6. Comparison with Other Countries

From a comparison with regulations in the European Union and the United States, it was found that these two regions already have more mature and holistic regulations in regulating the use of AI in criminal justice (Scherer, 2015). The European Union, with its AI Act, has provided clear guidelines on the fair and transparent use of AI, including the obligation to conduct audits and evaluations of the algorithms used. Meanwhile, in the United States, although there is no federal regulation regulating AI in criminal justice, some states such as California have developed policies that prioritize accountability and transparency. This shows that Indonesia needs to immediately formulate regulations that are not only based on international standards, but also adapted to the social, legal, and cultural context in Indonesia (Prihatin Effendi et al., 2024).

7. Implications for Human Rights and Justice

It is crucial to emphasize that the application of artificial intelligence (AI) in the criminal justice system must be guided by the principles of human rights and justice. Algorithms used in legal processes must not disadvantage any particular group based on race, gender, or socio-economic status. To prevent such disparities, regulatory frameworks must include strict oversight mechanisms, mandatory bias testing, and robust personal data protection. Without comprehensive and enforceable regulations, the use of AI risks reinforcing existing inequalities and undermining the legitimacy of the justice system. Instead, AI should be positioned as a tool to enhance fairness, transparency, and efficiency in judicial processes. Based on the findings of this study, several policy recommendations are proposed to guide the formulation of AI regulations in Indonesia's criminal justice system. First, an algorithm audit mechanism should be mandated, requiring regular evaluation and testing of AI systems to identify and eliminate potential biases that may harm specific groups. Second, the principle of transparency and accountability must be embedded within AI governance, ensuring that the processes and outcomes of AI-assisted decision-making are open to scrutiny and can be held responsible. Third, personal data protection must be a central component of any AI regulation, given the sensitive nature of information processed in criminal proceedings. Lastly, there must be a clear guarantee of human engagement in every stage of AI-driven

decisions, reaffirming that legal judgments remain within human discretion and are consistent with the foundational values of justice and due process. Through these regulatory measures, Indonesia can develop a legal framework that not only anticipates technological advancement but also safeguards the rights and dignity of all its citizens.

Conclusion

This study highlights the critical need for regulating the use of artificial intelligence (AI) in Indonesia's criminal justice system, given the rapid expansion of AI applications in legal processes. While AI technologies offer the potential to enhance efficiency, accuracy, and decision-making speed, their use without clear legal safeguards poses significant risks—including algorithmic bias, privacy violations, and a lack of accountability. The comparative analysis shows that Indonesia remains behind countries such as the European Union and the United States, which have adopted more advanced regulatory frameworks, including algorithm audits, transparency mandates, and human oversight requirements. Although Indonesia has enacted the Personal Data Protection Law (PDP Law), it does not sufficiently address the specific challenges posed by AI in the criminal justice context. This gap underscores the urgency for a dedicated legal framework that ensures algorithmic transparency, protects personal data, guarantees human involvement in AI-based decisions, and preserves procedural fairness. Human oversight must remain central to safeguard justice and uphold public trust in the legal system. The recommendations proposed in this article—rooted in international best practices and contextualized to Indonesia's socio-legal environment—can serve as a foundation for policymakers to initiate the development of responsible AI governance in the judiciary. By framing AI regulation within a rights-based and accountability-focused approach, this study contributes to the emerging discourse on law and technology in Indonesia. Looking forward, Indonesia must anticipate future ethical and legal dilemmas arising from AI integration by developing adaptive, transparent, and inclusive legal instruments. This is essential not only to mitigate risks but also to ensure that AI remains a tool to promote justice, not to undermine it.

References

Arfani, R. N., & Ambardi, K. (2024). *Transformasi Digital dan Daya Saing Seleksi Kasus*. Yogyakarta: UGM Press.

Barlian, A. E. A., Latipulhayat, A., Rusmiati, E., Wulandari, W., & Sukma, A. N. A. (2025). Electronic Criminal Justice in Indonesia: Challenges and the Future Measures. *Jambura Law Review, 7(1), 243–274*.

Chakraborty, U. (2020). *Artificial Intelligence for All: Transforming Every Aspect of Our Life*. New Delhi: BPB Publications.

De Almeida, P. G. R., dos Santos, C. D., & Farias, J. S. (2021). Artificial intelligence regulation: a framework for governance. *Ethics and Information Technology, 23(3), 505–525*.

Dessani, Y., Afrilia, B., & Nelwati, S. (2023). Building Pillars of Justice and Order: Uncovering the Challenges and Solutions of Equitable Law Enforcement in Indonesia. *Hakamain: Journal of Sharia and Law Studies, 2(1), 117–128*.

Fernando, Z. J., Kristanto, K., Anditya, A. W., Hartati, S. Y., & Baskara, A. (2023). Robot Lawyer in Indonesian Criminal Justice System: Problems and Challenges for Future Law Enforcement. *Lex Scientia Law Review, 7(2), 489–528*.

Land, M. K., & Aronson, J. D. (2020). Human Rights and Technology: New Challenges for Justice and Accountability. *Annual Review of Law and Social Science, 16(1), 223–240*.

Mayson, S. G. (2018). Bias in, Bias out. *Yale Law Journal, 128, 2218.*

McKay, C. (2020). Predicting Risk in Criminal Procedure: Actuarial Tools, Algorithms, AI and Judicial Decision-Making. *Current Issues in Criminal Justice, 32*(1), 22–39.

Min, A. (2023). Artificial Intelligence And Bias: Challenges, Implications, and Remedies. *Journal of Social Research, 2(11).*

Pasaribu, M. (2024). Penerapan Kecerdasan Buatan (Artificial Intelligence) Dalam Proses Legislasi dan Sistem Peradilan di Indonesia. *Jurnal Hukum Dan Bisnis (Selisik), 10(2), 163–181.*

Permana, Y. P., Kom, S., & Kom, M. (2025). *Kecerdasan Buatan: Mengubah Dunia dengan Teknologi.* Sumedang: Mega Press Nusantara.

Prihatin Effendi, S. H., Ningsih, D. W., Nasichin, M., Abdul Basid, & Yati Vitria, (2024). *Reformasi Hukum Pidana Indonesia*. Padang: Takaza Innovatix Labs.

Raharjo, B. (2023). *Teori Etika Dalam Kecerdasan Buatan (AI).* Semarang: Penerbit Yayasan Prima Agus Teknik

Rusydi, M. T. (2025). *Pengantar Hukum Teknologi*. Yogyakarta: Naga Pustaka.

Scherer, M. U. (2015). Regulating Artificial Intelligence Systems: Risks, Challenges, Competencies, and Strategies. *Harvard Journal of Law & Technology*, *29*, 353.

Silander, D. (2019). *The European Commission and Europe 2020: Smart, sustainable and inclusive growth. In Smart, Sustainable and Inclusive Growth*. Cheltenham, Britania Raya: Edward Elgar Publishing.

Smuha, N. A., Ahmed-Rengers, E., Harkens, A., Li, W., MacLaren, J., Piselli, R., & Yeung, K. (2021). *How the EU can achieve legally trustworthy AI: a response to the European Commission's proposal for an Artificial Intelligence Act*. University of Birmingham

Turner Lee, N. (2018). Detecting Racial Bias in Algorithms and Machine Learning. *Journal of Information, Communication and Ethics in Society*, *16*(3), 252–260.