

Algorithmic Justice: A Study on Risks and Opportunities in the Use of Artificial Intelligence by Judges in Courts

Tri Suhendra Arbani

Universitas Islam Negeri Alauddin Makassar

Email : tri.suendra@uin-alauddin.ac.id

Article Info	ABSTRACT
<p>Article history:</p> <p>Received 30 Maret 2025</p> <p>Revised 07 Mei 2025</p> <p>Accepted 19 Juni 2025</p>	<p><i>This study examines the ethical and legal challenges of using Artificial Intelligence (AI) in judicial systems, with a specific focus on Indonesia. It seeks to explore the risks, opportunities, and implications of AI in judicial decision-making, emphasizing the importance of balancing efficiency with fairness and accountability. The study employs a normative legal research approach with a conceptual framework and prescriptive analysis. It includes a comparative analysis of global practices and theoretical frameworks to contextualize AI's use within Indonesia's judicial landscape. This research highlights a unique focus on the intersection of algorithmic justice and the Indonesian judiciary, addressing the current lack of regulatory and ethical frameworks in AI adoption for judicial decision-making. It also proposes practical solutions to integrate AI responsibly while maintaining judicial integrity. The findings indicate that AI can significantly improve judicial efficiency and reduce case backlogs. However, risks such as algorithmic bias, ethical dilemmas, and legal uncertainties must be addressed. Comparative insights from countries like Singapore and Estonia underscore the necessity for clear regulations and ethical safeguards. The study concludes that Indonesia must adopt a balanced approach to integrate AI into its judiciary. Robust legal frameworks, ethical oversight, and adaptive evaluations of AI systems are critical to ensuring AI's role in promoting fairness, accountability, and public trust in judicial processes.</i></p> <p>Keyword :. Algorithmic Justice; Artificial Intelligence; Judges; Algorithmic Bias.</p>
<p>Kata Kunci:</p> <p>Keadilan Algoritmik; Kecerdasan Buatan; Hakim; Bias Algoritmik</p>	<p>Penelitian ini mengkaji tantangan etis dan hukum dalam penggunaan <i>Artificial Intelligence</i> (AI) di sistem peradilan, khususnya di Indonesia. Penelitian ini mengeksplorasi risiko, peluang, dan implikasi penggunaan AI dalam pengambilan keputusan hukum, dengan menekankan pentingnya keseimbangan antara efisiensi, keadilan, dan akuntabilitas. Penelitian ini menggunakan pendekatan penelitian hukum normatif dengan kerangka konseptual dan analisis preskriptif. Studi ini juga melibatkan analisis komparatif praktik global dan kerangka teori untuk mengontekstualisasikan penggunaan AI dalam sistem peradilan Indonesia. Penelitian ini memberikan fokus unik pada keadilan algoritmik dalam konteks peradilan Indonesia, yang saat ini belum memiliki kerangka regulasi dan etika yang jelas terkait adopsi AI. Penelitian ini juga menawarkan solusi praktis untuk mengintegrasikan AI secara bertanggung jawab tanpa mengurangi integritas peradilan. Hasil penelitian menunjukkan bahwa AI dapat meningkatkan efisiensi peradilan dan mengurangi penumpukan perkara. Namun, risiko seperti bias algoritmik, dilema etis, dan ketidakpastian hukum perlu diatasi. Temuan komparatif dari negara seperti Singapura dan Estonia menegaskan pentingnya</p>

regulasi yang jelas dan pengawasan etis. Penelitian ini menyimpulkan bahwa Indonesia perlu mengambil pendekatan yang seimbang dalam mengintegrasikan AI ke dalam sistem peradilan. Kerangka hukum yang kuat, pengawasan etis, dan evaluasi adaptif terhadap sistem AI sangat penting untuk memastikan AI dapat mendukung keadilan, akuntabilitas, dan kepercayaan publik dalam proses peradilan

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Introduction

The use of Artificial Intelligence (AI) in modern judiciary systems has sparked a complex and compelling debate. Proponents of AI emphasize its ability to streamline legal processes, reduce judges' workload, and enhance consistency in judicial decisions.¹ By leveraging AI, vast amounts of data can be systematically and swiftly analyzed, enabling legal decisions to be made based on accurately identified patterns and legal precedents. For countries with high judicial case backlogs, such as Indonesia, the implementation of AI is seen as a promising solution to alleviate the burden on the judiciary. On the other hand, critics raise significant concerns about the impact of AI on substantive justice. AI algorithms often rely on existing datasets, which means that biases inherent in these datasets could be perpetuated in the decisions produced. For instance, if training data reflect societal inequalities or discrimination, the AI's decisions might perpetuate or even exacerbate these biases. Additionally, there is a risk that reliance on AI may

¹ Bagus Gede Ari Rama, Dewa Krisna Prasada, and Kadek Julia Mahadewi, "Urgensi Pengaturan Artificial Intelligence (AI) Dalam Bidang Hukum Hak Cipta Di Indonesia," *Jurnal Rechtsens* 12, no. 2 (2023): 209–24, <https://doi.org/10.56013/rechtsens.v12i2.2395>.

undermine judicial independence, where judges rely solely on AI recommendations without conducting further critical analysis.²

Another pressing issue is the lack of transparency in AI algorithms. Many AI systems operate as "black boxes," making their decision-making processes difficult to understand or access. This raises significant ethical questions, as transparency is a cornerstone of a fair legal system. In this context, the pros and cons of utilizing AI in judicial settings highlight the necessity of finding a balance between technological efficiency and adherence to justice principles.³ A report from the International Bar Association (IBA) in 2023 revealed that approximately 30% of judicial institutions in developed countries have begun employing AI in various aspects of legal proceedings. AI technology is utilized to assist in document analysis, identify patterns in previous cases, and even provide decision-making recommendations. In Singapore, for instance, the use of AI in courts has successfully expedited the resolution of simple commercial disputes by up to 40% faster than traditional methods. However, another report by the OECD underscores that only 25% of these courts have established specific policies or regulations governing the use of AI technology. This reveals a significant gap between the adoption of technology and the legal frameworks that support its implementation. Without adequate regulation, the use of AI risks creating various problems, including legal uncertainty and potential misuse.

² Yenni Batubara, "Perlindungan Hukum Pemanfaatan System Artificial Intelligence Berdasarkan Undang-Undang Nomor 28 Tahun 2014," *Jurnal Al-Maqasid* 10, no. 1 (2024): 37–48.

³ Indra Padillah Akbar and Asep Sarifudin, "Legalitas Kecerdasan Buatan (Artificial Intelligence) Sebagai Subjek Hukum Pemegang Hak Paten," *NUSANTARA: Jurnal Ilmu Pengetahuan Sosial* 11, no. 2 (2024): 779–88, <http://jurnal.um-tapsel.ac.id/index.php/nusantara/article/view/14217/0%0Ahttp://jurnal.um-tapsel.ac.id/index.php/nusantara/article/download/14217/8507>.

In Indonesia, research on the application of AI in judicial processes remains limited. Over the past few years, initiatives to introduce digital technology in courts, such as e-Court and e-Litigation, have gained traction. Nevertheless, the application of AI as a decision-making aid remains a subject that requires deeper exploration, especially concerning the readiness of legal and technological infrastructures.⁴ One of the primary issues surrounding the use of AI by judges is the extent to which this technology can support substantive justice without compromising judicial independence. This question becomes increasingly pertinent given the risks of bias within AI systems, which could reflect inequalities embedded in the datasets they use. Furthermore, can judges who utilize AI still be considered fully independent in their decision-making processes?

Another critical concern is the lack of transparency in AI algorithms. Judges and parties involved in the judicial process may not understand how AI decisions or recommendations are generated. This lack of clarity could erode trust in the decisions rendered, both from the public and from legal practitioners. Regulation regarding the use of AI in judicial systems is also minimal, both nationally and internationally. In Indonesia, no specific legal framework addresses the use of AI in the judicial system. This raises questions about accountability mechanisms in cases where errors or deviations occur in decisions based on AI recommendations.

The increasing integration of Artificial Intelligence (AI) into judicial systems globally has sparked extensive debate regarding its potential to enhance efficiency and accuracy in legal decision-making. However, its application also

⁴ clianta Manuella Kondoahi, "Regulasi Hukum Terhadap Perlindungan Karya Cipta Lagu Yang Dihasilkan Oleh Teknologi Artificial Intelligence," *Lex_Administratum* 12, no. 5 (2024).

raises profound ethical, legal, and technical challenges, particularly when considering the role of judges in courts. The core issue revolves around the balance between leveraging technology to improve judicial efficiency and preserving the essential human values that underpin the judicial process. For Indonesia, a nation grappling with prolonged case backlogs and systemic inefficiencies in the judiciary, the adoption of AI presents both opportunities and risks.⁵

One pressing concern is the ethical dilemma posed by AI in decision making. The judicial process is inherently human, requiring empathy, moral reasoning, and discretion qualities that AI, as a tool of pure logic and data, cannot replicate. There is a fear that reliance on AI might undermine the human element of justice, reducing complex legal matters into mere algorithmic outputs. Furthermore, biases embedded within AI systems arising from flawed or incomplete training data pose the risk of perpetuating systemic discrimination, which contradicts the principles of fairness and equality. These ethical concerns demand a critical examination of whether AI can genuinely assist without compromising the integrity of judicial decisions.⁶

Another significant issue is the lack of a clear legal framework in Indonesia for regulating the use of AI in judicial systems. Current legal structures are ill equipped to address the complexities of AI, such as accountability in cases of erroneous decisions or data breaches. Questions arise about who should be held responsible the developers, the users, or the system itself when an AI system

⁵ Nabila Fitri Amelia et al., "Implementasi Artificial Intelligence (AI) Dalam Pembentukan Peraturan Perundang-Undangan Di Indonesia," *Eksekusi: Jurnal Ilmu Hukum Dan Administrasi Negara* 2, no. 1 (2023): 56–70, <https://doi.org/10.55606/eksekusi.v2i1.789>.

⁶ Lu Sudirman, "Implikasi Artificial Intelligence Terhadap Pelayanan Bantuan Hukum Bagi Penyandang Disabilitas," *ADIL: Jurnal Hukum* 14, no. 2 (2015): 112.

delivers a flawed recommendation. This legal vacuum creates uncertainty and leaves room for misuse or manipulation of AI technologies in the judicial process, potentially undermining public trust in the system. The technical limitations of AI also come into play.⁷ While AI systems can process vast amounts of data and provide analyses faster than human judges, they lack contextual understanding and the ability to adapt to unique case specific nuances. This limitation becomes critical in legal systems like Indonesia's, where cultural and societal values often influence judicial decisions. The question then becomes whether AI, even as a supportive tool, can adequately account for these contextual variables without compromising the quality of justice delivered.

In addition, global experiences provide both lessons and warnings for Indonesia. Countries such as Estonia and Singapore have pioneered AI adoption in their legal systems, focusing on administrative efficiency and predictive analytics. However, their implementation has been accompanied by strict regulations and oversight mechanisms to mitigate ethical and legal risks. Indonesia, by contrast, lacks such preparatory measures, raising concerns about whether the country is ready to embrace similar advancements responsibly.

This study aims to address these complex and interrelated issues by exploring the risks and opportunities associated with AI usage by judges in courts. It seeks to provide a critical analysis of the ethical dilemmas, regulatory gaps, and technical limitations of AI while contextualizing these challenges within Indonesia's unique legal landscape. Through a comparative approach and

⁷ Komarhانا Amboro, "Prospek Kecerdasan Buatan Sebagai Subjek Hukum Perdata Di Indonesia," *Prospek Kecerdasan Buatan Sebagai Subjek Hukum Perdata Di Indonesia* 21, No. 2 (2021): 193–217.

engagement with relevant theoretical frameworks, this research hopes to offer practical recommendations that not only advance judicial efficiency but also preserve the principles of justice, fairness, and accountability in the face of technological innovation. This study employs John Rawls' theory of distributive justice to evaluate the extent to which AI can uphold principles of equitable justice. According to Rawls, justice is the fair distribution of rights and responsibilities within a society. In this context, AI is expected to help ensure that legal decisions are not only efficient but also fair to all parties involved.

Additionally, Andrew Feenberg's critical theory of technology is used to analyze the social and political impacts of AI adoption in judicial systems. Feenberg argues that technology is not merely a neutral tool but also reflects certain values and interests. Therefore, the implementation of AI in the judiciary should be viewed as a process influenced by social, political, and cultural dynamics. This research offers a novel approach by examining the use of AI in the context of Indonesia's legal system, which has unique characteristics and challenges compared to other countries. The study's focus on algorithmic justice also represents a fresh perspective, as there has been limited exploration of the ethical and legal implications of AI usage by judges in Indonesia. Furthermore, this research proposes a framework for regulations and ethical guidelines that can support the responsible implementation of AI in judicial systems.

This study is essential to provide a comprehensive understanding of how AI can be effectively and fairly used in judicial systems. By offering evidence based policy recommendations, this research aims to serve as a foundation for policymakers, judges, and technology developers in ensuring that AI is utilized in

a manner that supports justice principles and enhances public trust in the legal system. Without clear frameworks, there is a risk that this technology could exacerbate existing injustices in society. Ultimately, while the integration of AI in judicial systems holds immense potential to revolutionize the legal landscape, it is imperative to ensure that this technology is implemented with careful consideration of ethical, legal, and societal impacts. Striking the right balance between technological innovation and the preservation of justice principles will be key to realizing AI's transformative promise in the judiciary.

The integration of Artificial Intelligence into the judicial system, while promising transformative benefits, demands careful consideration of its ethical, legal, and practical implications. The complexities of blending advanced technology with the inherently human and moral dimensions of judicial decision making present a unique challenge. For Indonesia, a country striving to modernize its judiciary and address systemic inefficiencies, the adoption of AI offers both opportunities and risks that cannot be overlooked. This study seeks to contribute to the ongoing discourse by providing a comprehensive analysis of the risks and opportunities associated with AI usage by judges, grounded in ethical principles and legal frameworks. By critically examining global practices and contextualizing them within Indonesia's legal landscape, this research aspires to provide practical recommendations that balance technological innovation with the preservation of judicial integrity. Ultimately, this is not just about integrating technology but ensuring that such integration serves the broader goal of delivering justice that is not only efficient but also fair, accountable, and human centered.

Method

This research employs a normative legal research method with a conceptual approach to thoroughly analyze the legal and ethical aspects of using AI in judicial decision making.⁸ The conceptual approach is utilized to explore key concepts such as judicial independence, algorithmic bias, and the principle of transparency. Furthermore, this study applies a prescriptive analysis method to formulate recommendations for addressing identified issues.

Primary data sources include statutory regulations, judicial decisions, and international standards on the use of AI in the judiciary. Secondary sources are derived from legal literature, academic journals, and reports from international organizations, such as the OECD and the International Bar Association.

The research process involves a critical review of existing legal frameworks and ethical guidelines in countries that have implemented AI in their judicial systems. This is complemented by a comparative analysis to identify best practices and potential challenges. The prescriptive analysis then provides actionable recommendations tailored to the Indonesian context, focusing on regulatory frameworks, ethical standards, and mechanisms to ensure accountability and transparency in AI assisted decision making. Through this methodology, the study aims to bridge the gap between technological advancements and legal principles, ensuring that the adoption of AI in judicial systems aligns with the fundamental principles of justice and fairness.

⁸ Peter Mahmud Marzuki, *Penelitian Hukum*, Edisi revisi (Jakarta : Kencana, 2019).

DISCUSSION

The Ethical and Legal Dilemmas of AI Implementation in Judicial Decision Making

The application of AI in judicial systems offers significant potential to enhance efficiency and transparency in case management. With the ability to process large amounts of data quickly and thoroughly, AI can help identify patterns in legal decisions and provide recommendations based on big data analysis. However, concerns arise that reliance on AI might undermine the independence of judges, potentially compromising their role as the ultimate arbiters of justice.⁹

In Indonesia, the introduction of systems like e Court and e Litigation marks a significant step toward digital transformation in judiciary processes. However, implementing AI in judicial decision making requires clear regulations and robust accountability mechanisms to ensure this technology does not violate individual rights. Additionally, there are concerns about algorithmic bias, which may affect case outcomes, particularly when the training data contains systemic biases. Some legal scholars argue that AI should be seen as an assistive tool rather than a substitute for human judgment. Judicial decision making is not merely about analyzing facts but also understanding social contexts, cultural values, and moral considerations. Therefore, it is crucial to ensure that AI is used proportionally and does not overshadow the central role of judges in the courtroom.¹⁰

⁹ Paulus Wisnu Yudoprakoso, "Kecerdasan Buatan (Artificial Intelligence) Sebagai Alat Bantu Proses Penyusunan Undang-Undang Dalam Upaya Menghadapi Revolusi Industri 4.0 Di Indonesia," *Simposium Hukum Indonesia* 1, no. 1 (2019): 574–86, <http://journal.trunojoyo.ac.id/shi>.

¹⁰ Deslaely Putranti and Kurnia Dewi Anggraeny, "Tanggung Jawab Hukum Inventor Atas Inovasi Kecerdasan Buatan (Artificial Intelligence) Di Indonesia," *Jurnal Hukum & Pembangunan* 52, no. 3 (2022): 781–92, <https://doi.org/10.21143/jhp.vol52.no3.3375>.

Studies indicate that implementing AI in judicial systems can expedite case management processes, ranging from document analysis to drafting legal recommendations. AI can also identify trends in criminal behavior or legal patterns through big data, enhancing efficiency and consistency in decision making.

However, research emphasizes that the final decision should always remain in the hands of judges. This ensures that non technical aspects, such as empathy and substantive justice, are not neglected. Some studies argue that while AI excels in data analysis, it may struggle in cases requiring moral and ethical considerations. Furthermore, AI has limitations in understanding nuanced aspects of legal facts, especially in cases involving complex ethical judgments. Hence, many countries restrict the use of AI to technical aspects like administrative case management, leaving substantive decision making to human judges.

The application of AI in judiciary systems can be analyzed through John Rawls' theory of distributive justice. Rawls posits that justice should be understood as the fair distribution of rights, duties, and benefits within a society. In this context, AI is expected to assist judges in achieving consistent decisions, thereby strengthening the principle of distributive justice.¹¹ On the other hand, Andrew Feenberg's critical theory of technology provides a contrasting perspective. Feenberg argues that technology, including AI, is never entirely neutral. Its design and application often reflect underlying values, which may not always be explicitly acknowledged. This is particularly relevant in judicial contexts, where algorithmic bias can perpetuate existing structural injustices.

¹¹ Eka Nanda Ravizki and Lintang Yudhantaka, "Artificial Intelligence Sebagai Subjek Hukum: Tinjauan Konseptual Dan Tantangan Pengaturan Di Indonesia," *Notaire* 5, no. 3 (2022): 351–76, <https://doi.org/10.20473/ntr.v5i3.39063>.

Both theories highlight that implementing AI in judicial systems requires not only technical innovation but also critical reflection on its broader implications for the legal system and society. Strict regulations and independent oversight are essential to ensure that AI aligns with prevailing justice values. Countries like the United States and Estonia have already begun integrating AI into their judicial systems. In the United States, AI tools such as COMPAS are used to assist judges in assessing a defendant's risk level. However, this system has been criticized for harboring deep racial biases. Conversely, Estonia employs AI to handle small claims efficiently, with decisions subject to appeal by a human judge.

In Asia, countries like Singapore focus on leveraging AI for administrative efficiency, such as drafting legal documents and monitoring corporate compliance. This approach emphasizes that AI can be a powerful assistive tool without replacing judicial decision making roles. Indonesia can learn from these countries to ensure that the application of AI in judicial systems is tailored to its unique social, cultural, and legal contexts. Clear regulations and stakeholder involvement are essential to ensure responsible use of this technology.

The integration of AI into judicial decision making represents a significant technological evolution, but its implications warrant a nuanced analysis. At its core, the debate centers on balancing efficiency with fairness. While AI can process massive datasets and assist in legal interpretations, its lack of human judgment poses critical challenges to its role in delivering substantive justice. One of the most pressing concerns is the issue of bias in AI systems. Algorithms are trained on

historical data, which may contain systemic biases reflecting societal inequities.¹²

For example, the COMPAS system used in the United States for risk assessments has faced accusations of racial discrimination. If similar biases were to infiltrate Indonesia's judicial AI systems, the impact on marginalized communities could be profound. Ensuring transparency in AI algorithms is crucial to mitigate such risks.

Another related issue is accountability. When a decision is partially or fully influenced by AI, questions arise regarding responsibility for errors or unjust outcomes. Legal frameworks in Indonesia currently lack explicit guidelines on the accountability of AI in judicial contexts. This gap must be addressed before AI can be implemented on a broader scale.

a. The Role of Ethics and Human Judgment

Judicial decisions are not merely mechanical applications of the law; they require an understanding of complex human experiences, moral reasoning, and cultural contexts.¹³ AI lacks the empathy and contextual awareness that judges inherently bring to their decisions. For instance, cases involving family disputes, cultural nuances, or moral dilemmas require a level of emotional intelligence that AI cannot replicate. Ethical considerations must guide the deployment of AI in courts. This includes clear boundaries on its use limiting AI to administrative tasks or legal research rather than direct involvement in verdicts. A hybrid model where AI

¹² Imelda Martinelli et al., "Urgensi Pengaturan Dan Perlindungan Rights of Privacy Terhadap Artificial Intelligence Dalam Pandangan Hukum Sebagai Social Engineering Imelda," *Jurnal Tana Mana* 4, no. 2 (2023): 158–66, <https://rechtenstudent.iain-jember.ac.id/index.php/rch/article/view/101>.

¹³ Miyuki Fattah Rizki and Abdul Salam, "Pertanggungjawaban Hukum Pengumpulan Data Biometrik Melalui Artificial Intelligence Tanpa Persetujuan Pemilik Data (Studi Kasus Clearview AI Inc. Di Yunani Dan Inggris)," *Lex Patrimonium* 2, no. 2 (2023): 1–16, <https://scholarhub.ui.ac.id/lexpatri> Available at: <https://scholarhub.ui.ac.id/lexpatri/vol2/iss2/9%0Ahttps://scholarhub.ui.ac.id/lexpatri/vol2/iss2/9>.

assists judges without replacing their authority could strike the right balance between innovation and justice.

b. Long Term Implications and the Need for Regulation

In the long term, the integration of AI could reshape public trust in the judicial system. On the one hand, consistent and efficient outcomes may boost confidence; on the other, perceived over reliance on technology might undermine trust. For Indonesia, which values legal pluralism and cultural sensitivity, the design and implementation of AI must align with local norms and values. Regulatory measures are crucial in defining the scope and limitations of AI in judicial contexts. These measures should ensure that the use of AI adheres to constitutional principles, respects human rights, and prioritizes fairness. A robust regulatory framework, combined with periodic audits of AI systems, can provide the necessary checks and balances.

c. Potential for Innovation and Collaboration

Despite the challenges, AI offers unparalleled opportunities for innovation in Indonesia's judicial system.¹⁴ Beyond decision making, AI could streamline case tracking, enhance legal research, and reduce court backlogs. Collaborative efforts between legal professionals, technologists, and ethicists are essential to ensure that AI's benefits are maximized while its risks are minimized. Drawing from international examples, Indonesia could establish pilot programs that test AI in specific court functions before scaling up. Lessons from countries like Estonia and

¹⁴ Chiquita Thefirsly Noerman and Rosalia Dika Agustanti, "Pertanggungjawaban Artificial Intelligence Sebagai Subjek Hukum Yang Melakukan Tindak Pidana Korupsi," *Jurnal Hukum Samudra Keadilan* 18, no. 2 (2023): 388–405, <https://doi.org/10.33059/jhsk.v18i2.8722>.

Singapore demonstrate the value of gradual implementation combined with rigorous evaluation.

The use of AI in judicial systems is a double edged sword. While its potential to revolutionize efficiency and consistency is undeniable, its limitations in addressing nuanced human experiences cannot be overlooked. For Indonesia, the challenge lies in finding a harmonious balance where AI acts as a supportive tool, enhancing judicial processes without undermining judicial independence or fairness. Achieving this balance requires a clear regulatory framework, ongoing ethical scrutiny, and a commitment to preserving the human essence of justice.

Strategies to Address Ethical and Legal Challenges of AI in Judicial Systems

The implementation of AI in judicial decision making introduces complex ethical and legal challenges. These issues include the lack of accountability for AI generated decisions, potential biases embedded in algorithms, and the need for transparency in how AI systems operate. In Indonesia, these challenges are further complicated by the country's pluralistic legal system, which incorporates elements of civil law, customary law (adat), and Islamic law. A major concern is the absence of a comprehensive regulatory framework governing AI usage in judicial processes.¹⁵ Without clear regulations, the risk of misuse or over dependence on AI systems increases, potentially undermining public trust in the judiciary. Additionally, ethical challenges such as the erosion of judicial discretion and human empathy in decision making must be carefully managed to prevent injustice.

¹⁵ Hari Sutra Disemadi, "Urgensi Regulasi Khusus Dan Pemanfaatan Artificial Intelligence Dalam Mewujudkan Perlindungan Data Pribadi Di Indonesia," *Jurnal Wawasan Yuridika* 5, no. 2 (2021): 177, <https://doi.org/10.25072/jwy.v5i2.460>.

Research highlights the necessity of regulatory frameworks tailored to address AI's ethical and legal challenges. Effective frameworks must establish clear boundaries on AI's role in judicial decision making, ensuring that it remains a tool for assistance rather than a substitute for human judgment. Moreover, there is a growing consensus that transparency and accountability mechanisms are vital to building public trust in AI powered judiciary systems.

For example, studies suggest that embedding explainable AI (XAI) principles into judicial systems can enhance transparency by making AI decisions understandable to judges and litigants. Additionally, accountability measures, such as auditing algorithms for biases and ensuring compliance with ethical standards, are critical. The ethical and legal challenges of AI in judicial systems can be analyzed through deontological ethics and utilitarianism.¹⁶ Deontological ethics emphasize adherence to rules and principles, suggesting that AI systems should be regulated to ensure they align with the judiciary's moral and legal obligations. For instance, using biased AI systems, even if efficient, would be considered unethical under this framework.

In contrast, utilitarianism focuses on maximizing overall benefits. Proponents argue that despite its challenges, AI can significantly reduce court backlogs and improve access to justice, particularly for underserved populations. The utilitarian perspective emphasizes mitigating ethical concerns without abandoning the transformative potential of AI.

¹⁶ Muhammad Hanan Nuhi et al., "Pembaharuan Hukum Penanganan Tindak Pidana Pemalsuan Identitas Akibat Penyalahgunaan Artificial Intelligence Di Indonesia," *Jurnal Batavia* 1, no. 2 (2024): 80–88.

Countries like Singapore and Estonia offer valuable insights into addressing AI's ethical and legal challenges. In Singapore, a cautious approach is taken, where AI is used primarily for administrative tasks, such as e discovery and legal research, ensuring that judges retain full control over substantive decisions. This approach prioritizes transparency and human oversight. In Estonia, AI is deployed for small claims courts, but all decisions are subject to appeal by a human judge, thus maintaining a safeguard against potential errors or biases. These examples demonstrate that AI can be integrated effectively into judicial systems when its role is clearly defined and ethically regulated. Indonesia can adopt similar strategies by starting with pilot projects and focusing on administrative use cases before expanding AI's role. Establishing an ethical AI committee and involving diverse stakeholders, including legal professionals and technologists, could further enhance accountability.

Findings from various jurisdictions reveal that addressing ethical and legal challenges requires a multifaceted approach.¹⁷ Theories such as stakeholder theory emphasize the importance of involving multiple stakeholders in the development and regulation of AI systems. This includes judges, legal scholars, technologists, and the public. Additionally, institutional theory suggests that embedding AI within existing judicial frameworks should not disrupt core institutional values, such as independence and impartiality. AI systems must therefore be designed to complement rather than replace human judgment, ensuring that ethical standards are preserved.

¹⁷ Jajang Nurzaman and Dwi Fidhayanti, "Keabsahan Kontrak Yang Dibuat Oleh Artificial Intelligence Menurut Hukum Positif Di Indonesia," *Al-Adl: Jurnal Hukum* 16, no. 1 (2024): 140, <https://doi.org/10.31602/al-adl.v16i1.12710>.

To effectively address the ethical and legal challenges of AI in judicial systems, Indonesia must prioritize three key areas: regulation, transparency, and education. First, regulatory frameworks should clearly delineate AI's role and establish robust accountability mechanisms. Laws should mandate periodic audits of AI algorithms to detect biases and ensure compliance with ethical standards.¹⁸ Second, transparency must be a guiding principle in AI implementation. Explainable AI (XAI) technologies can help judges and litigants understand the reasoning behind AI generated recommendations, fostering trust and mitigating concerns about algorithmic opacity. Lastly, education and training programs are essential for judges and legal professionals. These programs can bridge the gap between technology and law, enabling practitioners to use AI tools responsibly and effectively. Collaborations with academic institutions and technology developers can facilitate knowledge exchange and skill building.

To address the ethical and legal challenges of using AI in judicial systems, Indonesia must prioritize building a solid and adaptive regulatory framework. This framework should not only align with technological advancements but also emphasize justice, transparency, and accountability. The following are practical recommendations to improve AI related regulations in the Indonesian judiciary:

a. Develop Comprehensive Legislation

Indonesia needs to establish clear laws specifically designed for the use of AI in judicial systems. These laws should outline the permissible roles of AI, define accountability structures, and ensure adherence to international standards for

¹⁸ Ekinia Karolin Sebayang, Mahmud Mulyadi, and Mohammad Ekaputra, "Potensi Pemanfaatan Teknologi Artificial Intelligence Sebagai Produk Lembaga Peradilan Pidana Di Indonesia," *Locus Journal of Academic Literature Review* 3, no. 4 (2024): 317–28, <https://doi.org/10.56128/ljoalr.v3i4.311>.

ethical AI use. Regular evaluations and audits should also be mandated to identify and correct biases or system flaws.

b. Make Explainable AI (XAI) Mandatory

Transparency is key to building trust in AI. Every AI system used in judicial decision making should have the capability to explain its processes and recommendations in clear, understandable terms. This will allow judges, litigants, and the public to verify and challenge AI generated decisions if needed.

c. Create an Ethical Oversight Body

Indonesia should establish a multidisciplinary oversight body consisting of legal experts, ethicists, technologists, and civil society representatives.¹⁹ This body would review AI systems before they are used in courts and continuously monitor their compliance with ethical and legal standards.

d. Start with Pilot Projects

A gradual and cautious approach is crucial. Indonesia should begin by implementing AI in less critical areas, such as administrative tasks or legal research, before expanding its use to core judicial functions. Pilot projects would provide valuable insights and allow for adjustments based on real world applications.

e. Enhance Training Programs for Judges

Judges and court staff must be equipped to work alongside AI tools. Training programs should focus on understanding the strengths and limitations of AI, ensuring judicial independence, and addressing any ethical dilemmas arising from

¹⁹ Noerman and Agustanti, "Pertanggungjawaban Artificial Intelligence Sebagai Subjek Hukum Yang Melakukan Tindak Pidana Korupsi."

AI assisted decision making. Partnerships with academic institutions and tech companies could enhance these initiatives.

f. Foster Public Engagement and Awareness

Public trust is essential for the successful adoption of AI in judicial processes.²⁰ The government should actively engage with the public through consultations, educational campaigns, and open discussions. Addressing concerns about privacy, fairness, and accountability will foster inclusivity and trust in the system.

Reforming AI regulations for the judiciary in Indonesia is both a challenge and an opportunity. By adopting a strategic approach that combines legal reforms, transparency, and public engagement, Indonesia can leverage the benefits of AI while safeguarding its justice system. These steps will ensure that AI remains a tool for improving efficiency and fairness without compromising ethical and legal standards.

The ethical and legal challenges of AI in judicial systems are significant but not insurmountable. By learning from international best practices and tailoring solutions to its unique legal landscape, Indonesia can harness the potential of AI while safeguarding justice and fairness. A cautious, transparent, and well regulated approach is essential to ensure that AI serves as a valuable tool in advancing judicial processes without compromising ethical and legal standards.

²⁰ Tegar Raffi et al., "Menilik Pro Dan Kontra Pemanfaatan Dan Penetapan Status Hukum Artificial Intelligence Dalam Hukum Positif Indonesia," *Journal of Analytical Research, Statistics and Computation* 3, no. 1 (2024): 51–70, <https://www.jarsic.org/main/article/view/28/18>.

Conclusion

The integration of AI into judicial decision making presents both opportunities and significant challenges. Ethically, concerns revolve around the potential loss of judicial discretion, erosion of empathy, and the risk of embedding biases within algorithms. Legally, the lack of clear regulatory frameworks and accountability measures amplifies these risks, leaving room for misuse and public distrust. While AI has the potential to enhance efficiency and reduce case backlogs, its implementation must be approached cautiously. A well regulated framework, aligned with ethical principles, is essential to ensure that AI remains a supportive tool that complements, rather than replaces, human judgment.

Effectively addressing the ethical and legal challenges of AI in judicial systems requires a multidimensional approach. Regulatory measures must prioritize transparency, accountability, and oversight, while ensuring alignment with ethical standards. The adoption of explainable AI technologies can foster public trust by making AI generated decisions comprehensible. Comparative insights from countries like Singapore and Estonia demonstrate the importance of maintaining human oversight and safeguarding against potential algorithmic biases. For Indonesia, the path forward involves incremental implementation, stakeholder collaboration, and continuous evaluation to create a balanced framework where AI enhances judicial efficiency without compromising fairness or justice.

REFERENCE

- Akbar, Indra Padillah, and Asep Sarifudin. "Legalitas Kecerdasan Buatan (Artificial Intelligence) Sebagai Subjek Hukum Pemegang Hak Paten." *NUSANTARA: Jurnal Ilmu Pengetahuan Sosial* 11, no. 2 (2024): 779–88. <http://jurnal.um-tapsel.ac.id/index.php/nusantara/article/view/14217/0%0Ahttp://jurnal.um-tapsel.ac.id/index.php/nusantara/article/download/14217/8507>.

- Amboro, Komarhana. "PROSPEK KECERDASAN BUATAN SEBAGAI SUBJEK HUKUM PERDATA DI INDONESIA." *Prospek Kecerdasan Buatan Sebagai Subjek Hukum Perdata Di Indonesia* 21, no. 2 (2021): 193–217.
- Batubara, Yenni. "PERLINDUNGAN HUKUM PEMANFAATAN SYSTEM ARTIFICIAL INTELLIGENCE BERDASARKAN UNDANG-UNDANG NOMOR 28 TAHUN 2014." *Jurnal Al-Maqasid* 10, no. 1 (2024): 37–48.
- Disemadi, Hari Sutra. "Urgensi Regulasi Khusus Dan Pemanfaatan Artificial Intelligence Dalam Mewujudkan Perlindungan Data Pribadi Di Indonesia." *Jurnal Wawasan Yuridika* 5, no. 2 (2021): 177. <https://doi.org/10.25072/jwy.v5i2.460>.
- Fattah Rizki, Miyuki, and Abdul Salam. "Pertanggungjawaban Hukum Pengumpulan Data Biometrik Melalui Artificial Intelligence Tanpa Persetujuan Pemilik Data (Studi Kasus Clearview AI Inc. Di Yunani Dan Inggris)." *Lex Patrimonium* 2, no. 2 (2023): 1–16. <https://scholarhub.ui.ac.id/lexpatriAvailableat:https://scholarhub.ui.ac.id/lexpatri/vol2/iss2/9%0Ahttps://scholarhub.ui.ac.id/lexpatri/vol2/iss2/9>.
- Gede Ari Rama, Bagus, Dewa Krisna Prasada, and Kadek Julia Mahadewi. "Urgensi Pengaturan Artificial Intelligence (AI) Dalam Bidang Hukum Hak Cipta Di Indonesia." *Jurnal Rechtsens* 12, no. 2 (2023): 209–24. <https://doi.org/10.56013/rechtsens.v12i2.2395>.
- Kondoahi, Cianta Manuella. "REGULASI HUKUM TERHADAP PERLINDUNGAN KARYA CIPTA LAGU YANG DIHASILKAN OLEH TEKNOLOGI ARTIFICIAL INTELLIGENCE." *Lex Administratum* 12, no. 5 (2024).
- Lu Sudirman. "IMPLIKASI ARTIFICIAL INTELLIGENCE TERHADAP PELAYANAN BANTUAN HUKUM BAGI PENYANDANG DISABILITAS." *ADIL: Jurnal Hukum* 14, no. 2 (2015): 112.
- Martinelli, Imelda, Yohana, Cora Venessa, and Eudora Joyce Hiumawan. "Urgensi Pengaturan Dan Perlindungan Rights of Privacy Terhadap Artificial Intelligence Dalam Pandangan Hukum Sebagai Social Engineering Imelda." *Jurnal Tana Mana* 4, no. 2 (2023): 158–66. <https://rechtenstudent.iain-jember.ac.id/index.php/rch/article/view/101>.
- Nabila Fitri Amelia, Diva Maura Marcella, Hening Jiwa Semesta, Sabrina Budiarti, and Saskiana Fitra Usman. "Implementasi Artificial Intelligence (AI) Dalam Pembentukan Peraturan Perundang-Undangan Di Indonesia." *Eksekusi: Jurnal Ilmu Hukum Dan Administrasi Negara* 2, no. 1 (2023): 56–70. <https://doi.org/10.55606/eksekusi.v2i1.789>.
- Noerman, Chiquita Thefirsly, and Rosalia Dika Agustanti. "Pertanggungjawaban Artificial Intelligence Sebagai Subjek Hukum Yang Melakukan Tindak Pidana Korupsi." *Jurnal Hukum Samudra Keadilan* 18, no. 2 (2023): 388–405. <https://doi.org/10.33059/jhsk.v18i2.8722>.
- Nuhi, Muhammad Hanan, Logan Al Khozi, Syakira Nazla, and Davina Syakirah. "Pembaharuan Hukum Penanganan Tindak Pidana Pemalsuan Identitas Akibat Penyalahgunaan Artificial Intelligence Di Indonesia." *Jurnal Batavia* 1, no. 2 (2024): 80–88.
- Nurzaman, Jajang, and Dwi Fidhayanti. "Keabsahan Kontrak Yang Dibuat Oleh Artificial Intelligence Menurut Hukum Positif Di Indonesia." *Al-Adl: Jurnal Hukum* 16, no. 1 (2024): 140. <https://doi.org/10.31602/al-adl.v16i1.12710>.
- Peter Mahmud Marzuki. *Penelitian Hukum*. Edisi revi. Jakarta : Kencana, 2019.

- Putranti, Deslaely, and Kurnia Dewi Anggraeny. “Tanggung Jawab Hukum Inventor Atas Inovasi Kecerdasan Buatan (Artificial Intelligence) Di Indonesia.” *Jurnal Hukum & Pembangunan* 52, no. 3 (2022): 781–92. <https://doi.org/10.21143/jhp.vol52.no3.3375>.
- Raffi, Tegar, Putra Jumanoro, Nadhif Nur Rahmansyah, and Jessenia Hayfa. “Menilik Pro Dan Kontra Pemanfaatan Dan Penetapan Status Hukum Artificial Intelligence Dalam Hukum Positif Indonesia.” *Journal of Analytical Research, Statistics and Computation* 3, no. 1 (2024): 51–70. <https://www.jarsic.org/main/article/view/28/18>.
- Ravizki, Eka Nanda, and Lintang Yudhantaka. “Artificial Intelligence Sebagai Subjek Hukum: Tinjauan Konseptual Dan Tantangan Pengaturan Di Indonesia.” *Notaire* 5, no. 3 (2022): 351–76. <https://doi.org/10.20473/ntr.v5i3.39063>.
- Sebayang, Ekinia Karolin, Mahmud Mulyadi, and Mohammad Ekaputra. “Potensi Pemanfaatan Teknologi Artificial Intelligence Sebagai Produk Lembaga Peradilan Pidana Di Indonesia.” *Locus Journal of Academic Literature Review* 3, no. 4 (2024): 317–28. <https://doi.org/10.56128/ljoalr.v3i4.311>.
- Yudoprakoso, Paulus Wisnu. “KECERDASAN BUATAN (Artificial Intelligence) SEBAGAI ALAT BANTU PROSES PENYUSUNAN UNDANG-UNDANG DALAM UPAYA MENGHADAPI REVOLUSI INDUSTRI 4.0 DI INDONESIA.” *Simposium Hukum Indonesia* 1, no. 1 (2019): 574–86. <http://journal.trunojoyo.ac.id/shi>.