Artificial Intelligence and Legal Transformation: Towards an Adaptive Justice System

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Abstract
The development of artificial intelligence (AI) has had a major impact on various sectors, including the legal and judicial systems, which demand a transformation towards digitalization and efficiency. This research aims to analyze the contribution of AI in transforming conventional legal practices towards a more adaptive justice system, as well as examine the ethical, regulatory, and technological challenges that arise. This research uses a qualitative approach with *literature studies* as the main technique, reviewing *literature*, legal documents, and case studies of the application of AI in the judicial system in various countries. The findings show that AI is able to improve the efficiency and accuracy of legal processes, but its implementation still faces obstacles in terms of regulation, algorithm transparency, and institutional readiness. The transformation of the legal system through AI is inevitable, but it needs to be accompanied by regulatory reform, increased legal digital literacy, and the principle of prudence in its application to uphold substantive justice.
Keywords: Artificial Intelligence, Legal Transformation, Adaptive Justice System.

INTRODUCTION

The judiciary, as an institution that resolves legal conflicts, has a vital function in maintaining justice, order, and legal certainty in society. In carrying out its functions, the judicial system is required not only to uphold the applicable legal norms, but also to be adaptive to social, economic, and especially technological developments. The changing times, marked by the digital revolution and technological transformation, demand a comprehensive reform of the way legal institutions and judicial apparatus work (Collins & Halverson, 2018; Knell, 2021; Kneuer & Milner, 2019; Kurniawan, 2022; Salmela-Aro & Motti-Stefanidi, 2022).

One of the most influential technologies today is artificial intelligence (AI). The presence of AI has changed the conventional paradigm in the legal world, from the automation of *jurisprudence* and legal document searches, to AI's ability to analyze *big legal data*, predict the outcome of decisions, and even help draft contracts automatically and efficiently (Bodenstedt et al., 2020; Busnatu et al., 2022; Emile et al., 2022; Hassan et al., 2023; Miller, 2019). This opens up great opportunities for the legal world to become faster, more efficient, and data-driven.

According to Richard Susskind, digital transformation in the legal world is no longer an option, but a necessity. He stressed that "legal professionals must be prepared for the technological disruption that will replace many traditional roles in legal practice." Furthermore, Susskind underlined that the future of the legal profession is greatly influenced by the ability to understand and utilize information technology appropriately.

In line with that, Daniel Martin Katz and Michael J. Bommarito "highlight how AI algorithms have been successfully applied in a variety of modern legal practices, including in decision-making based on *predictive analytics*." AI has been used by large law firms and judicial institutions in developed countries to reduce administrative workloads, improve document accuracy, and even detect potential bias in court decisions.

However, the adoption of AI in the justice system also poses serious challenges, especially in the aspects of ethics, algorithm transparency, personal data protection, and substantive justice. Lawrence B. Solum emphasized that "the use of AI in law must be accompanied by a strong legal and ethical approach, to prevent the misuse of technology or inequality in access to justice."

In the Indonesian context, technology-based legal transformation is still in its early stages. Several efforts have been made, such as the digitization of trials through *e-Court* and *e-Litigation* implemented by the Supreme Court, but the comprehensive integration of AI in the national legal system still faces regulatory challenges, infrastructure, and human resource capacity.

The integration of artificial intelligence (AI) into the legal system has been studied in various international contexts, with a focus on improving efficiency, transparency, and the automation of legal tasks (Charles et al., 2023; Kumar et al., 2023; Lugo Virguez et al., 2024; Rathore, 2023; Talaat et al., 2023). For example, Katz and Bommarito (2017) highlight the growing application of AI in *predictive analytics* and decision-making in developed countries, significantly enhancing the efficiency of legal processes. Similarly, Susskind (2019) argues that the legal profession must adapt to digital transformation to stay relevant, emphasizing the need for legal professionals to embrace AI to avoid being left behind. While these studies contribute valuable insights into the potential of AI in the legal world, they often overlook the challenges specific to the integration of AI in developing countries, such as Indonesia, where regulatory frameworks and human resources are still in early stages of development.

This research aims to examine the implementation of AI in the Indonesian legal context, focusing on the opportunities and challenges that AI faces in improving efficiency while addressing concerns such as ethics, algorithm transparency, and data protection. By analyzing Indonesia's regulatory challenges and infrastructural constraints, this study aims to contribute to the development of an adaptive, efficient, and equitable justice system that incorporates AI technology responsibly. The research's findings are expected to inform policymakers, legal practitioners, and tech developers on how to implement AI-based legal reforms that are both effective and ethically sound. Thus, the urgency of studying how artificial intelligence can be integrated into the legal and judicial systems is of paramount importance. AI-based legal transformation must be carried out carefully and progressively in order to encourage the birth of an adaptive, efficient, and sustainable justice system.

METHOD

This research was normative legal research with a qualitative approach, which aimed to understand and analyze phenomena in depth based on textual and conceptual data. The research focused on understanding the substance of law in the context of technological developments, especially artificial intelligence (AI), as well as its impact on the justice system.

The method used was *library research*, where data were obtained through a review of scientific literature, legal documents, and case studies of the application of AI in legal systems in various countries. *Literature studies* enabled researchers to explore legal theories, principles, and practices relevant to the research topic.

The data sources in this study were divided into two: (1) Primary data, in the form of laws and regulations, such as Law Number 11 of 2008 concerning Information and Electronic Transactions, Law Number 48 of 2009 concerning Judicial Power, as well as international policies and regulations related to legal technology; and (2) Secondary data, including books, journal articles, previous research results, as well as reports on legal institutions that discussed the integration of AI in the judicial system.

RESULTS AND DISCUSSION
The Role of Artificial Intelligence in Legal Practice

The development of artificial intelligence (AI) technology has had a significant impact in various sectors, including in the legal field. In the context of legal transformation, AI plays a role not only as an administrative tool, but also as an instrument of faster, efficient, and data-driven legal analysis and decision-making. The use of AI in the legal field represents a form of technological response to the increasingly complex and dynamic needs of the judicial world.

AI has been used to automate a variety of legal tasks, including jurisprudence search, contract creation, and court judgment prediction. Katz and Bommarito state that "technology can read thousands of legal documents with speeds and accuracy that surpasses human capabilities".

An example of the implementation of AI in the judiciary can be seen in "*the COMPAS* system in the United States used for the risk analysis of recidivism. Despite having ethical controversies, this shows that AI is able to play a role in making legal decisions in a more objective and data-driven manner".

However, the use of AI in legal practice is not free from criticism and challenges, especially related to algorithm transparency, accountability of automated decisions, and the possibility of systemic bias. Therefore, the role of AI must be placed as a supporting instrument, not a substitute, in law enforcement that upholds the values of justice and human rights.

Thus, the role of AI in legal practice shows that technology can contribute significantly to the modernization of the legal system. However, its use must be accompanied by clear regulations, prudential principles, and professional ethics for AI to truly reinforce, not replace, fundamental values in legal and judicial practice.

Ethical and Legal Challenges

Along with the increasing adoption of artificial intelligence in the legal system, there are also challenges that cannot be ignored, both in terms of ethics and the legal framework that governs its use. The sophistication of technology is not necessarily risk-free—in fact, in a legal context that upholds fairness and certainty, the presence of AI raises fundamental questions about responsibility, procedural fairness, and individual rights.

The use of AI in the judiciary leaves major challenges, especially related to accountability, algorithm transparency, and the potential for data discrimination. Solum emphasized that "the application of AI in law must be accompanied by the principle of prudence and strong ethical norms".

In addition, legal regulations need to be reorganized to respond to AI developments. The phenomenon *of regulatory lag* is an obstacle to rapidly adopting innovation in the traditional legal system. In terms of regulation, the legal system faces the *phenomenon of regulatory lag*, which is legal delay in responding to technological developments that move very quickly. The law as a normative and reflective norm is often left behind in anticipating new risks from AI, such as personal data protection issues, legal liability for damage due to system errors, and discriminatory biases from the datasets used to train AI. Therefore, it is necessary to reformulate norms and policies that can bridge the gap between the speed of innovation and the principle of legal justice.

These challenges show that the transformation of the legal system through AI is not only a technical issue, but also requires a holistic normative approach. Collaboration between policymakers, legal scientists, and technology developers is needed to formulate an ethical and legal framework that can accommodate innovation without compromising the principles of justice and human rights.

In other words, the integration of AI in law must be accompanied by adaptive regulations that are able to regulate its use responsibly. Without a strong ethical and legal approach, AI has the potential to become a tool of domination, not empowerment, in the justice system.

Towards an Adaptive Judicial System

The changing legal landscape due to technological advancements, particularly artificial intelligence (AI), requires the judicial system to not only react, but also be proactive in managing this transformation. Adaptability is not just technical readiness, but the openness of the legal system to innovation without sacrificing the integrity of the law itself. An adaptive justice system is a system that is able to transform with the changing times but remains firm in maintaining the principles of justice, transparency, and accountability.

An adaptive justice system is an institutional and normative construct that is willing to be open to technological innovation, but still upholds the values of substantive justice. Some of the strategic steps towards this transformation include: updating the legal education curriculum to be responsive to technological issues, improving the digital literacy of law enforcement officials, and developing ethical and inclusive technology-based policies. These three are important pillars in creating a modern and globally competitive legal ecosystem.

An adaptive justice system is a system that is open to technological updates but still upholds the values of justice. Updating the legal education curriculum, improving the digital literacy of law enforcement officials, and developing technology-based policies are strategic steps towards this transformation.

According to Floridi, "a digital ethical framework is needed that is able to bridge the sophistication of AI with the principles of substantive justice". This transformation is certainly not without challenges. However, with a structured policy direction, progressive legal education, and maintained professional ethics, the Indonesian legal system can move towards

a more adaptive, inclusive, and sustainable judicial system. The judiciary of the future is not just a digital courtroom, but a smart and fair legal ecosystem, capable of navigating the complexities of the times with integrity.

Thus, building an adaptive justice system in the age of AI is not only a technocratic responsibility, but also a moral mandate to keep technology in control of noble and humane legal values.

CONCLUSION

Artificial intelligence (AI) holds great promise for modernizing and making the legal system more adaptive, but its integration must be carefully managed to ensure ethical, regulatory, and institutional readiness. While AI can enhance judicial analysis, automate legal document drafting, and predict case outcomes to improve efficiency, it also raises concerns about algorithm transparency, accountability, and data bias, which could impact substantive justice if not properly addressed. The successful adoption of AI in the judiciary requires balancing technological innovation with fundamental legal values, supported by regulatory reforms, capacity building, and a technology-based legal curriculum. Future research should explore the long-term impacts of AI on judicial independence and access to justice, as well as develop best practices for fostering collaboration among policymakers, legal practitioners, and technology developers to ensure that AI-driven reforms uphold justice and legal certainty.

REFERENCES

Bodenstedt, S., Wagner, M., Müller-Stich, B. P., Weitz, J., & Speidel, S. (2020). Artificial intelligence-assisted surgery: potential and challenges. *Visceral Medicine*, *36*(6), 450–455. https://doi.org/10.1159/000511351

Busnatu, Ștefan, Niculescu, A.-G., Bolocan, A., Petrescu, G. E. D., Păduraru, D. N., Năstasă, I., Lupușoru, M., Geantă, M., Andronic, O., & Grumezescu, A. M. (2022). Clinical applications of artificial intelligence—an updated overview. *Journal of Clinical Medicine*, *11*(8), 2265. https://doi.org/10.3390/jcm11082265

Charles, V., Emrouznejad, A., & Gherman, T. (2023). A critical analysis of the integration of blockchain and artificial intelligence for supply chain. *Annals of Operations Research*, *327*(1). https://doi.org/10.1007/s10479-023-05169-w

Collins, A., & Halverson, R. (2018). *Rethinking education in the age of technology: The digital revolution and schooling in America*. Teachers College Press.

Emile, S. H., Ghareeb, W., Elfeki, H., El Sorogy, M., Fouad, A., & Elrefai, M. (2022). Development and validation of an artificial intelligence-based model to predict gastroesophageal reflux disease after sleeve gastrectomy. *Obesity Surgery*, *32*(8), 2537–2547. https://doi.org/10.1007/s11695-022-06112-x

Hassan, A. M., Rajesh, A., Asaad, M., Nelson, J. A., Coert, J. H., Mehrara, B. J., & Butler, C. E. (2023). A surgeon's guide to artificial intelligence-driven predictive models. *The American Surgeon*, *89*(1), 11–19. https://doi.org/10.1177/00031348221103648

Knell, M. (2021). The digital revolution and digitalized network society. *Review of Evolutionary Political Economy*, *2*(1), 9–25.

Kneuer, M., & Milner, H. V. (2019). The digital revolution and its impact for political science. *M. Kneuer and HV Milner, Political Science and Digitalization–Global Perspectives. Opladen, Germany: Verlag Barbara Budrich*, 7–21.

Kumar, S., Lim, W. M., Sivarajah, U., & Kaur, J. (2023). Artificial Intelligence and Blockchain Integration in Business: Trends from a Bibliometric-Content Analysis. *Information Systems Frontiers*, *25*(2). https://doi.org/10.1007/s10796-022-10279-0

Kurniawan, I. G. A. (2022). Digitalization of Business Law: Urgency and Orientation of the Industrial Revolution 4.0 and Society 5.0. *Volksgeist: Jurnal Ilmu Hukum Dan Konstitusi*, *5*(2). https://doi.org/10.24090/volksgeist.v5i2.6847

Lugo Virguez, I. R., Pérez, Y. S., Castellano Montiel, A. G., & Sanabria Navarro, J. R. (2024). Decision-making on sports talent for endogenous economic growth: Talents Colombia. *Retos*, *51*. https://doi.org/10.47197/RETOS.V51.100740

Miller, T. (2019). Explanation in artificial intelligence: Insights from the social sciences. *Artificial Intelligence*, *267*, 1–38.

Rathore, Dr. B. (2023). Digital Transformation 4.0: Integration of Artificial Intelligence & Metaverse in Marketing. *Eduzone : International Peer Reviewed/Refereed Academic Multidisciplinary Journal*, *12*(01). https://doi.org/10.56614/eiprmj.v12i1y23.248

Salmela-Aro, K., & Motti-Stefanidi, F. (2022). Digital Revolution and Youth. *European Psychologist*, *27*(2), 73–75. https://doi.org/https://doi.org/10.1027/1016-9040/a000483

Talaat, M., Elkholy, M. H., Alblawi, A., & Said, T. (2023). Artificial intelligence applications for microgrids integration and management of hybrid renewable energy sources. *Artificial Intelligence Review*, *56*(9). https://doi.org/10.1007/s10462-023-10410-w