AI ON THE BENCH: THE FUTURE OF JUDICIAL SYSTEMS IN THE AGE OF ARTIFICIAL INTELLIGENCE

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Abstract

This in-depth research explores the emerging relationship between artificial intelligence (AI) and legal systems by addressing key questions and understanding the evolution of global justice systems. This study focuses on the role of AI in strengthening the efficiency and objectivity of the judiciary, especially through the application of AI as judges in countries such as China and Estonia. This research aims to systematically analyse these developments, examining how AI is being integrated into justice systems in different parts of the world with challenges related to ethics, accountability, and human rights. The study results show that the integration of AI in the legal system brings increased efficiency and potential for transparency but also raises serious concerns about bias in AI algorithms, limitations in interpreting complex laws, and the impact on human rights principles. The main findings of this research show that the integration of AI in the legal system contains great potential for transformation but also requires a careful approach. While AI can improve the efficiency and quality of decision-making, it is important that AI is developed and implemented within a solid legal and ethical framework that respects human rights and maintains the justice system's integrity. This research emphasizes the need to consider each country's unique legal, cultural, and social context when adopting AI into their legal systems.

Keywords: Artificial Intelligence, Judicial Systems, Legal Technology, AI Judges, Ethical Implications.

Introduction

Globalization has been a major catalyst in the era of technological development that we are witnessing today. This phenomenon, which crosses geographical boundaries, has resulted in rapid technological development that extends to all corners of the world.[1] In this context, not only developed countries are involved in this rapid technological flow but also developing countries that have been actively spurring technological development in their societies.[2] As a result of these global dynamics, technology has become a critical component of national progress and development, reflecting its importance in the global context.[3]

The Industrial Revolution 4.0, which is characterized by the integration of digital technology in many facets of life and business, is the result of this convergence between technology and globalization.[4] Several significant technological advancements are driving this revolution. The Internet of Things (IoT) connects physical devices and systems to the Internet, enabling seamless data exchange and process automation.[5] Blockchain provides a platform for transparent and secure transactions, changing the way we understand data security and integrity.[6] Artificial intelligence (AI), with its ability to process and analyze big data, has paved the way for smart innovation and adaptive

[1] Irena Andreeska, "TECHNOLOGY IN AN ERA OF GLOBALIZATION Irena Andreeska," in *Economics and Management: How to Cope With Disrupted Times* (Ljubljana: Association of Economists and Managers of the Balkans, Belgrade, Serbia, 2019).

[2] Robert Davison et al., "Technology Leapfrogging in Developing Countries – An Inevitable Luxury?," *Electronic Journal of Information Systems in Developing Countries* 1, no. 1 (2000).

[3] Mary Lowe Good, "The Globalization of Technology," *Physics Today* 49, no. 8 (1996).

[4] Prokhin Egor, "Digital Transformation of Industrial Companies: What Is Management 4.0?," in *ACM International Conference Proceeding Series*, 2020.

[5] Ashish Kumar Tamrakar et al., "Extended Review on Internet of Things (IoT) and Its Characterisation," *International journal of health sciences* (2022).

[6] Dev Arora et al., "Blockchain-Based Security Solutions to Preserve Data Privacy and Integrity," in *Proceedings - 2019 International Conference on Computing, Communication, and Intelligent Systems, ICCCIS 2019*, vol. 2019-January, 2019.

solutions. Big data has become the foundation for data-driven decision-making, enabling deeper and more predictive insights.[7]

Cloud computing offers flexibility and scalability in data storage and processing, while 3D printing has revolutionized manufacturing and product design. The combination of these technologies in the context of globalization has not only changed the industrial landscape but has also set new standards in innovation, efficiency, and interconnection in our global society. The Industrial Revolution 4.0, therefore, is not only a technological shift but also a representation of how global convergence and technology can shape our future.[8]

Artificial intelligence (AI) has revolutionized various industries. In healthcare, AI helps with diagnosis and treatment planning, as in the case of IBM Watson, which is used to help identify cancer treatment options.[9] Virtual assistants like Siri and Alexa make it easier to interact with technology in the world of technology and communication.[10] In transportation, projects like Tesla and Waymo's autonomous cars mark advancements in mobility.[11] In finance, AI is used for market analysis and risk management, such as automated trading algorithms used by investment firms. In the retail industry, AI aids in the automation of inventory management and the personalization of the shopping experience, as Amazon has done.[12] In law, AI, such as ROSS Intelligence, is used for legal research and document analysis, marking

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[7] Revathi Rajendran, Arthi Kalidasan, and Chidhambara B. Rajan, "Convergence of AI, ML, and DL for Enabling Smart Intelligence: Artificial Intelligence, Machine Learning, Deep Learning, Internet of Things," in *Challenges and Opportunities for the Convergence of IoT, Big Data, and Cloud Computing*, 2021.

[8] Fengwei Yang and Sai Gu, "Industry 4.0, a Revolution That Requires Technology and National Strategies," *Complex and Intelligent Systems* 7, no. 3 (2021).

[9] Zi Hang Chen et al., "Artificial Intelligence for Assisting Cancer Diagnosis and Treatment in the Era of Precision Medicine," *Cancer Communications*, 2021.

[10] Amrita S. Tulshan and Sudhir Namdeorao Dhage, "Survey on Virtual Assistant: Google Assistant, Siri, Cortana, Alexa," in *Communications in Computer and Information Science*, vol. 968, 2019.

[11] Pierluigi Coppola and Fulvio Silvestri, "Autonomous Vehicles and Future Mobility Solutions," in *Autonomous Vehicles and Future Mobility*, 2019.

[12] Manasa R. and A. Jayanthila Devi, "Amazon's Artificial Intelligence in Retail Novelty - Case Study," *International Journal of Case Studies in Business, IT, and Education* (2022).

advances in efficiency and access to justice.[13] AI is driving innovation and efficiency across many sectors, promising continued evolution in the future.

The Chinese government has taken a step forward in the justice field by integrating artificial intelligence (AI) into its judicial system. The Beijing Supreme Court has announced this initiative, which aims to increase the fairness and effectiveness of court decision-making.[14] In this context, AI plays a role in providing recommendations on legal considerations, drafting legal documents, and warning against possible human error in the decision-making process. AI's presence in the judicial realm is not just an add-on; it is required to be involved in all cases handled by the courts. The move marks a significant shift in how the justice system operates, demonstrating a serious attempt to combine technological advancement with legal integrity to achieve more objective and accurate justice. In a revolutionary move, the Chinese government has adopted artificial intelligence (AI) in its justice system, marking a breakthrough in how justice is administered.[15] With this implementation, AI plays a critical role in various aspects of the courts. It includes providing recommendations on legal reasoning, which can assist judges in making more informed and fair decisions. In addition, AI is also involved in the drafting of legal documents, ensuring that any administrative aspects of the court are organized with greater efficiency and accuracy. Another important function of AI is its ability to detect and warn about potential human errors in decision-making process. This aspect is crucial in reducing the risk of judicial errors that can seriously impact a case's outcome. The Chinese government has determined that the use of AI is not just an experiment but a mandatory component in all cases handled by the courts, demonstrating their

[13] Jamie J. Baker, "2018: A Legal Research Odyssey: Artificial Intelligence as Disruptor," *Law Library Journal*, 2018.

[14] Benjamin Minhao Chen and Zhiyu Li, "How Will Technology Change The Face of Chinese Justice?," *Columbia Journal of Asian Law* 34, no. 1 (2020).

[15] Changqing Shi, Tania Sourdin, and Bin Li, "The Smart Court – A New Pathway to Justice in China?," *International Journal for Court Administration* 12, no. 1 (2021).

strong commitment to technological innovation in the legal system to achieve better justice.[16]

The artificial intelligence (AI) introduced in China's judicial system encompasses more than just judicial data management; it is part of a broader, integrated system known as Smart Court SoS (System of Systems). The system is not only limited to collecting and analysing court data but is also directly connected to the Chinese police database.[17] This integration allows for a seamless exchange of information between the courts and the police, giving judges access to a wider and more in-depth data set when making decisions. The Smart Court SoS concept changes how courts interact with the rest of the legal system. Combining information from multiple sources, including police data, AI can provide a more comprehensive and accurate analysis of each case. It includes patterns in crime, behavioural trends, and the broader social context that may affect individual cases.[18]

China has always taken innovative steps in applying AI technology in its justice system, recently introducing a legal robot called Xiaofa. It is part of the country's efforts to integrate advanced technology into its justice system. Xiaofa is used to assist in the judicial process, demonstrating China's commitment to exploring the utilization of AI in the legal field.[19] The move reflects a global trend in which AI technology is increasingly utilized to support judicial processes and legal administration. Previously, Estonia has been a pioneer in the legal application of AI technology. The country has used AI to adjudicate small claims disputes, demonstrating the effectiveness of AI in improving the efficiency of court proceedings and reducing the case backlog. The use of AI in Estonia is focused on simple cases that do

[16] Nu Wang, "'Black Box Justice': Robot Judges and AI-Based Judgment Processes in China's Court System," in *International Symposium on Technology and Society, Proceedings*, vol. 2020-November, 2020.

[17] Caixia Zou, "Application of Artificial Intelligence in Judicial Proceeding in China," in *Proceedings - 2020 International Conference on Robots and Intelligent Systems, ICRIS 2020*, 2020.

[18] Shahmin Sharafat, Zara Nasar, and Syed Waqar Jaffry, "Data Mining for Smart Legal Systems," *Computers and Electrical Engineering* 78 (2019).

[19] Cheryl Patriana Yuswar, "AI Sebagai Hakim, Dapat Hilangkan Putusan Pengadilan Yang Bias?," *Kumparan.Com*.

not require a high level of discretion, allowing the AI system to process and issue decisions quickly and accurately.[20]

Implementing AI systems such as Xiaofa in China and using AI in courts in Estonia marks a significant step forward in modernizing the justice system. Providing judges with more advanced tools and integrated information is expected to reduce case handling time and improve the accuracy of trials. The ultimate goal of this technology integration is to deliver fairer and more objective justice, combining technological sophistication with human wisdom and discretion in the judicial process. These two examples show how different countries explore and implement AI technologies in their justice systems, each in a way that suits its legal context and needs. This approach aims to increase efficiency and improve access to justice and transparency in the justice system.

Discussion

The Interaction Between Artificial Intelligence and the Law

According to predictions from Accenture, by 2035, artificial intelligence (AI) will be a highly influential tool in the business world, potentially increasing business productivity by 40% and profitability by 38%.[21] It shows how significant AI role will play in changing the industrial landscape and business operations in the future. This support was also recognized in "The Manufacturer: Annual Manufacturing Report 2018," which found that 92% of executives in the manufacturing industry believe that AI and robotics have the ability to substantially improve work productivity. The report reflects a transition in the manufacturing industry, where the adoption of advanced technologies such as AI and robotics is considered an innovation and a necessity to remain competitive and efficient. Adopting these technologies marks an important shift from traditional production methods towards intelligent automation, where machines and AI algorithms collaborate with human labour to create more efficient, timely, and profitable processes. It

[20] Tanel Kerikmäe and Evelin Pärn-Lee, "Legal Dilemmas of Estonian Artificial Intelligence Strategy: In between of e-Society and Global Race," *AI and Society* 36, no. 2 (2021).

[21] Eduardo Plastino and Mark Purdy, "Game Changing Value from Artificial Intelligence: Eight Strategies," *Strategy and Leadership* 46, no. 1 (2018).

opens up a new era where the integration of AI in business becomes a key ingredient for growth and sustainability in an increasingly competitive global economy.

In 2017, Saudi Arabia made an unprecedented step in the history of artificial intelligence (AI) and international law by announcing granting citizenship to Sofia, an advanced robot created by Hanson Robotics.[22] This decision marks a watershed moment in the discussion over the legal status of AI, as, for the first time, a country has recognized a robot as a "citizen." Sofia, designed to resemble a human face and can mimic emotional expressions and communicate, gained global attention as an example of technological advancement in the field of AI. Saudi Arabia's granting of citizenship to Sofia is not just about symbolic recognition.[23] It raises profound questions regarding the legal rights and legal status that an AI entity like Sofia may have. For example, it raises questions about Sofia's rights and responsibilities as a citizen. In addition, it also raises questions about how the law should interact with AIs, especially in the context of civil rights, legal responsibilities, and possible ownership. The decision also opens up a discussion on AI's ethical and social implications in society. How can the existence and rights of AI entities like Sofia affect social, economic, and political dynamics?

Moreover, granting citizenship to robots also challenges our traditional understanding of citizenship, identity, and what it means to be "human" in the context of law and society. This situation reflects the urgent need to explore new legal and ethical frameworks that can address the presence and integration of AI in society. With this innovative move, Saudi Arabia is not only pushing the boundaries of technology but also challenging the legal world to rethink how we define and interact with artificial intelligence in a legal and social context.

Legal developments related to artificial intelligence (AI) and robotics have been an important topic in various countries, including Japan and Russia, each of which has demonstrated a unique approach to regulating AI entities. In Japan, in 2017, a robot named Shibuya Mirai was granted a residence permit. This move drew attention as usually

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[22] Mindy Weisberger, "Lifelike 'Sophia' Robot Granted Citizenship to Saudi Arabia," *Https://Www.Livescience.Com/60815-Saudi-Arabia-Citizen-Robot.Html.*

[23] Ugo Pagallo, "Vital, Sophia, and Co.-The Quest for the Legal Personhood of Robots," *Information (Switzerland)* 9, no. 9 (2018).

special regulations on residence permits in Japan are limited to certain categories such as foreign specialists, businessmen, scientists, artists, and a few other categories.[24] Granting a residence permit to a non-human entity such as Shibuya Mirai is an act that challenges the legal boundaries and long-established definitions of citizenship and residence.

Meanwhile, in Russia, more formal legal steps have been taken. In 2015, the Russian Parliament proposed the draft Grishin Law, which aims to amend the Civil Code of the Russian Federation.[25] This draft law focuses on the legal liability of robot developers, operators, or manufacturers. One important aspect of the draft is handling robot representation in court, reflecting recognition of the potential for more complex interactions between humans and machines. Furthermore, it also includes legal conventions related to model robotics and AI, which govern the manufacture and use of robots. It shows a serious legislative effort to integrate AI entities into the existing legal framework, ensuring clear rules and guidelines regarding how humans and machines can interact in society. These two examples, from Japan and Russia, show that countries worldwide are beginning to recognize and respond to the challenges brought by advances in AI and robotics. They reflect an understanding that these technologies are no longer just the domain of science fiction but are becoming an integral part of our social and legal reality. It calls for adaptation and innovation in the legal framework to address the new complexities posed by AI's presence in society.

The application of artificial intelligence (AI) in the legal field has also grown significantly, and recent developments show that AI is not only becoming a tool but is also starting to be recognized as an entity capable of performing more complex legal functions. For example, in July 2021, South Africa made history by becoming the first country to approve AI as an inventor in the context of intellectual property law. The Federal Court of Australia also made a similar decision, demonstrating the growing global acceptance of AI's legal applications.

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[24] Cheryl Patriana Yuswar, "AI Sebagai Hakim, Dapat Hilangkan Putusan Pengadilan Yang Bias?"

[25] A. A. Vasilyev, Zh I. Ibragimov, and E. V. Gubernatorova, "The Russian Draft Bill of 'the Grishin Law' in Terms of Improving the Legal Regulation of Relations in the Field of Robotics: Critical Analysis," in *Journal of Physics: Conference Series*, vol. 1333, 2019.

The impact of AI technology in legal education is also increasingly visible, with many law schools adding learning modules focused on AI and the law. Computerized tools and AI-related programs are now an important part of the curriculum, signalling a shift in legal education's approach to preparing future lawyers and judges for the digital age. The emergence of legal tech startups, associations, and conferences focused on technology in law illustrates the increasing interest and investment in this field.

In America and Europe, several universities have established specialized research and training centres focused on "AI law and technology." They are exploring the potential of AI in various legal functions, including the development of 'robot lawyers' and 'robot judges'.[26] Even in the United States, the use of AI in law has taken a step forward with innovations such as ROSS, an advanced AI system from IBM used by renowned law firm Baker Hostetler.[27] ROSS is designed to research, hypothesize, and respond by understanding human language and adapting to new information, increasing its effectiveness in legal cases. Joshua Browder, a 2015 Stanford University graduate in computer science, founded businesses like DoNotPay, which is based in California. Initially, DoNotPay operated as a chatbot that provided legal advice to consumers facing issues such as fines, late fees, and parking tickets.[28] In 2020, the company shifted its focus to the use of AI. The app gained popularity in the United Kingdom and the United States. Its functionality has expanded to assist users in drafting letters relating to issues ranging from insurance claims to tourist visa applications. It shows DoNotPay's evolution from its origins as a chatbot-based legal assistant to a more comprehensive legal aid tool, utilizing AI to facilitate the diverse legal needs of its users.

This development signals an important shift in the law, where AI is not just a tool but also potentially an entity capable of performing

[26] Ni Xu, Kung Jeng Wang, and Chen Yang Lin, "Technology Acceptance Model for Lawyer Robots with AI: A Quantitative Survey," *International Journal of Social Robotics* 14, no. 4 (2022).

[27] Jyoti Dabass and Bhupender Singh Dabass, "Scope of Artificial Intelligence in Law," *Journal of Management & Organization* 27, no. 5 (2018).

[28] Zico Junius Fernando et al., "Robot Lawyer in Indonesian Criminal Justice System: Problems and Challenges for Future Law Enforcement," *Lex Scientia Law Review* 7, no. 2 (2023).

more complex legal functions, opening up new discussions on the interaction of AI in legal and social contexts. With this development, AI is not just a tool but also an entity capable of performing more complex legal functions. It reflects an important shift in law, where AI has the potential to influence law and policy, raising new ethical and legal questions. With cases such as the Sofia robot being granted citizenship in Saudi Arabia or the Shibuya Mirai robot being granted residency in Japan, humans see how AI is beginning to be recognized in a broader legal and social capacity. Decisions like these drive global discussions about AI's rights and responsibilities in society.

In the context of technological advancements in law, the application of artificial intelligence (AI) in legal systems varies between common law and civil law systems, depending on the fundamental characteristics of each. Common law relies on precedents (case law) as the primary basis for decision-making, while civil law focuses more on applying existing statutory laws. These differences influence how AI is utilized in both legal systems, whether in legal research, decision-making processes, or administrative functions. The following table presents a comparison of AI roles in common law and civil law systems, covering aspects such as legal focus, AI roles, advantages, and limitations. This comparison aims to provide a deeper understanding of how AI can be effectively integrated and aligned with the characteristics of each legal system.

Table 1. Comparison of AI Roles in Common Law vs Civil Law Systems

Aspects	Common Law	Civil Law
Legal System Focus	Based on precedents (case law)	Based on statutes (statutory law)
Role of AI in Legal Research	AI traces relevant precedents and identifies decision patterns from past cases.	AI is extensively used to facilitate the interpretation of laws and regulations, often lengthy documents.
Decision-Making Role	AI provides recommendations based on analysis of similar previous cases.	AI assists in interpreting statutory articles for specific cases.
Role of Judges	Judges play a significant role in creating law through their rulings. AI supports this by analyzing precedent data.	Judges apply pre-existing laws. AI ensures decisions comply with legal texts.
Ethical and Bias Concerns	Higher risk of bias as AI relies on past case data that may reflect historical injustices.	Risk of bias in interpreting laws that can sometimes be unclear or ambiguous.
Technology Implementation	Focused on prediction systems and data analysis based on case patterns.	Focused on automating legal administration and regulatory analysis.
Use in Mediation	AI is used to offer data-driven solutions in contract disputes or business conflicts.	AI aids in drafting legal documents and contracts following statutory law.
AI Strengths	Enhances efficiency in finding legal precedents and supports judges with historical data.	Simplifies application of complex laws through text-based analysis.
Limitations	Challenges in ensuring consistency as precedents can vary across jurisdictions.	Limitations in addressing situations not explicitly covered by the law.

Source: processed from various sources

AI Behind Justice: Optimizing Judges' Decisions Through Artificial Intelligence

Since 2016, China has begun progressively integrating advanced technology into its judicial system. The initiative was started by China's Minister of Justice, Qiang Zhou, who saw the importance of developing systems and technologies to support judges in acting fairly, efficiently, and honourably.[29] The goal was clear: to enhance the credibility of the

[29] Cheryl Patriana Yuswar, "AI Sebagai Hakim, Dapat Hilangkan Putusan Pengadilan Yang Bias?"

judicial system in China. With this vision, the Chinese government is exploring the potential of technologies such as artificial intelligence (AI), which can analyze data extensively and objectively and provide recommendations that are based on evidence and data. This approach is expected to minimize personal bias and subjectivity in legal decision-making while improving the speed and efficiency of the judicial process. This effort is part of China's larger strategy to modernize its legal and judicial infrastructure, marking a transition towards a more transparent, technology-driven, and trustworthy justice system.[30] The move also reflects a recognition that judicial fairness and efficiency are important pillars in building public trust and maintaining the integrity of the legal system in a changing global era.

China's efforts to integrate advanced technology into its justice system demonstrate several important aspects. First, this integration reflects a recognition of the need for transparency and objectivity in legal decision-making. Using AI is expected to reduce human error and subjective biases that may arise in the judicial process. It creates a paradigm where technology is not just a tool but also a critical component in maintaining the integrity of justice. Secondly, there is the aspect of efficiency that cannot be ignored. The use of AI can speed up court proceedings in a justice system that frequently struggles with case backlogs and drawn-out procedures. It has the potential to reduce waiting times for justice seekers and improve the overall productivity of the justice system. Third, these initiatives also raise challenges and questions about how to balance technology with traditional legal principles. For example, how can we ensure that the recommendations provided by AI are in line with legal and ethical values? How does the legal system deal with issues such as legal interpretation by AI, which may not always follow human understanding of nuance and context? Finally, data privacy and security are considered. In systems that use AI, personal and case-law data becomes highly digitized, raising questions about how this data is protected from misuse or leakage. It requires strong security frameworks and clear privacy policies to maintain public trust. Thus, while integrating advanced technologies in the justice system offers many significant benefits, it also brings challenges that

[30] Alison (Lu) Xu, "Chinese Judicial Justice on the Cloud: A Future Call or a Pandora's Box? An Analysis of the 'Intelligent Court System' of China," *Information and Communications Technology Law* 26, no. 1 (2017).

must be carefully addressed to ensure that these technologies support rather than replace the principles of fair and transparent justice.

The Chinese government's proposed use of artificial intelligence (AI) in the justice system represents a significant advancement in the application and administration of the law.[31] This AI is designed to act as an administrative assistant in drafting legal documents and as a critical advisor in the legal decision-making process. With its ability to analyze data massively and objectively, AI is expected to provide legal reasoning recommendations that help judges make more informed and evidence-based decisions. Another important aspect of AI integration is its ability to detect and warn about possible human errors. Integrating AI in all cases handled by the court demonstrates a serious commitment to innovation and accuracy in the justice system. It reflects the recognition that, while humans are the primary actors in justice, technology can play an important role in improving the quality and efficiency of legal proceedings.[32] Through the utilization of AI, there is hope to reduce court errors, speed up legal proceedings, and improve the accessibility of justice for citizens. However, such initiatives also bring their own challenges, including ensuring that AI operates within the boundaries of legal ethics and does not replace the human role in legal judgments that require a deep understanding of social context and nuances. As such, the use of AI in courts is a promising step forward but must be undertaken with careful consideration of the balance between technology, ethics, and human needs in the legal system.

AI on the Bench: Opening a New Chapter in the World of Justice

Innovation in the judicial system through implementing artificial intelligence (AI) has been a focus in several countries, with Estonia and China being prime examples. Estonia has pioneered in this regard, implementing AI judges to adjudicate small claims disputes, such as

[31] Chen Mingtsung and Li Shuling, "Research on the Application of Artificial Intelligence Technology in the Field of Justice," in *Journal of Physics: Conference Series*, vol. 1570, 2020.

[32] Giampiero Lupo and Jane Bailey, "Designing and Implementing E-Justice Systems: Some Lessons Learned from EU and Canadian Examples," *Laws* 3, no. 2 (2014).

contract cases, under 7,000 euros.[33] This move was taken to improve efficiency in government services and address the backlog of court cases. The use of AI in these cases is considered efficient due to its simple nature. It does not require high level of discretion, allowing the AI system to process and issue decisions quickly and accurately.

On the other hand, China has taken a different tack in applying AI in its justice system. They have introduced a robot called Xiaofa, which is designed to provide legal advice and assist the public in understanding legal terminology. With the ability to access answers to over 40,000 litigation questions and handle 30,000 legal issues, Xiaofa has become a valuable tool in China's justice system.[34] The deployment of Xiaofa and over 100 other robots in courts nationwide is part of China's efforts to transition to 'smart justice'. These robots not only assist in retrieving case histories and past rulings to reduce the workload of court officials but also specialize in certain areas, such as commercial law or labour law. These applications of AI in the justice system in Estonia and China show how technology can be used to improve the efficiency and effectiveness of courts. In Estonia, AI is used to reduce the burden of small cases, while in China, AI assists in providing accurate legal information and advice. Both strategies attempt to address the difficulties that traditional justice systems face, which frequently deal with a high volume of cases. With 120,000 judges in China handling around 19 million cases annually, finding innovative solutions is urgent. Implementing AI in the justice system offers a way to achieve this, promising to increase access to justice, reduce waiting times and costs, and improve the overall quality of legal services.[35]

Adding AI to the justice system, as seen in the cases of Estonia and China, also brings another important dimension in the context of legal system integrity and transparency. In many countries, including those experiencing problems with corruption in the justice system, the use of AI can offer a promising solution. In situations where many judges may be entangled in corrupt practices, the implementation of AI

[33] Karin Sein, "Private Enforcement of Competition Law – the Case of Estonia," *Yearbook of Antitrust and Regulatory Studies* 6, no. 8 (2013).

[34] Panca Sarjana Putra et al., "Judicial Transformation: Integration of AI Judges in Innovating Indonesia's Criminal Justice System," *Kosmik Hukum* 23, no. 3 (2023).

[35] Ekaterina P. Rusakova, "Integration of 'Smart' Technologies in the Civil Proceedings of the People's Republic of China," *RUDN Journal of Law* 25, no. 3 (2021).

could be a means to reduce the potential for manipulation and bias in legal decision-making. With its algorithms based on data and facts, AI is not susceptible to external or personal influences, such as financial or political interests, that can affect human judges. The use of AI in adjudicating certain cases can help create a more objective system where decisions are based on analysis of available data and evidence rather than on external factors. In this context, AI can act as a deterrent to corruption, increasing public confidence in the justice system. However, the use of AI must also be balanced with strict oversight and adequate regulation to ensure that AI systems operate within ethical and legal boundaries. It includes ensuring transparency in AI decision-making processes and allowing human oversight and review to scrutinize AI-generated decisions. With a careful and controlled approach, integrating AI into the justice system can be a significant step forward in fighting fairer and more transparent justice.

The use of AI judges in the justice system brings significant opportunities and challenges. Opportunities include increased efficiency in managing cases, reduced case backlogs, and the potential to prevent corruption by removing human subjectivity in decision-making. AI can provide fast and data-driven decisions, which improves access to justice, especially in high-volume cases. However, its challenges cannot be ignored either. First, there are concerns about the accountability and transparency of decisions taken by AI. How AI makes decisions and whether humans can clearly understand its processes are critical questions. Second, there is a risk of bias in AI, depending on the data used to train its algorithms. AI decisions can also be biased if the data is incomplete or biased. Third, there are ethical and legal questions about replacing human decision-making with machines, particularly in cases involving complex nuances and context. Integrating AI into the justice system requires a careful balance between leveraging the advantages of technology and maintaining integrity and fairness in the legal process. It is important to develop strong legal and ethical frameworks to govern the use of AI in the judiciary, ensuring that these technologies are used responsibly and fairly.[36]

[36] N.V. Kravchuk, "ARTIFICIAL INTELLIGENCE AS A JUDGE: PROSPECTS AND CONCERNS," *Pravovedenie LAZH*, no. 1 (2021).

Human Rights and Digital Justice in the Age of AI: Toward the Future of Indonesian Judiciary Based on Pancasila

In the context of legal positivism, the establishment of a legitimate authority's rule of law serves as the foundation for the legitimacy of AI judges. According to this view, if AI operates within the boundaries of recognized law, its actions can, in theory, be considered legally valid. However, this raises important questions about AI's ability to interpret and apply the law in a deep and contextualized way, especially in cases that require complex ethical or moral considerations. A key challenge is ensuring that AI not only follows the law mechanically but can also understand and apply broader principles of justice, including ethical and moral aspects that are often not fully governed by written legal rules. This demands AI design that is not only technically sophisticated but also sensitive to the complexities of law and social values. When using AI as a judge, it is important to recognize that AI may not fully understand a particular legal case's ethical and moral nuances. While AI can follow established legal rules, its capacity to understand the social context, culture, and values behind the law is limited. Therefore, while AI actions may be considered legal within the formal legal framework, there is still a need to consider aspects that go beyond pure legal logic. It includes understanding how principles of justice, ethics, and human values can be integrated into AI decision-making to ensure that its decisions are not only legally valid but also fair and ethical in practice.

In the context of natural law theory, using AI as a judge poses a particular challenge, as this theory holds that there are universal moral principles that the law must follow. A key issue in applying AI here is its ability to understand and apply principles of ethics and justice that are often not explicitly defined in written legal rules. AI, which is based on algorithms and data, may not have the intrinsic ability to interpret and apply these ethical principles, which often require a deep understanding of human context and social values. It raises concerns that AI decisions may be technically correct according to the law but not necessarily reflect justice in a broader sense. Therefore, the integration of AI in the judiciary demands a very careful approach to ensure that the resulting decisions are aligned with the principles of justice and ethics that are at the core of natural law theory. A key consideration is how AI processes and integrates universal moral principles that are often abstract and uncodified. While AI can

effectively manage and apply clear and defined legal rules, its capacity to navigate grey areas, where fairness and ethics come into play, is questionable.[37] It is where the sophistication of AI is put to the test: is it possible to program algorithms that not only analyze data objectively but also consider the ethical values underlying natural law? It is a significant challenge, as it requires AI programming that is not only technical but also philosophical, accommodating the complexities of human morality in legal decision-making.[38] In the context of human rights, several important principles must be considered:

1. Justice and Equality
   In the context of human rights, the principles of fairness and equality are particularly important when considering the use of AI judges. The Universal Declaration of Human Rights emphasizes everyone's right to a fair trial. Although AI judges have the potential to increase efficiency and consistency in courts, serious concerns exist regarding their ability to reflect substantive and procedural justice. One of the main questions is whether AI is able to understand and integrate the social and cultural nuances that often influence legal decisions. Justice in court is not just about deciding based on facts and law but also considering the broader context of each case, which can include social, cultural, and even individual aspects. This poses a challenge for AI, which may not have the same sensitivity and understanding as human judges.
2. Transparency and Accountability
   In the context of human rights, transparency and accountability in court proceedings are crucial. The use of AI in court poses the risk of a "black box," where the AI decision-making process is often not fully transparent or easy to understand. This creates complex accountability issues. For example, if an AI decision cannot be explained in a way that a human can understand, it is difficult to determine who is responsible for the decision. Accountability becomes blurred, especially in cases where AI

[37] Matthew Le Bui and Safiya Umoja Noble, "We're Missing a Moral Framework of Justice in Artificial Intelligence: On the Limits, Failings, and Ethics of Fairness," *The Oxford Handbook of Ethics of AI* (2020).

[38] Keith Miller, "Can We Program Ethics into AI? [Reflections]," *IEEE Technology and Society Magazine*, 2017.

decisions significantly impact individuals' rights. Transparency in AI algorithms and their decision-making processes is important to ensure the justice system remains fair and accountable.

3. Privacy and Data Protection
   The right to privacy is a key element of human rights, and in the context of the use of AI judges, it is particularly important. Significant concerns exist about how AI systems collect, store, and analyse legal data and individuals' personal data. Data protection and privacy must be strictly guaranteed. It involves ensuring that sensitive and personal data is not misused or accidentally exposed during court proceedings. This privacy protection is not only important for maintaining public trust in the justice system but also for maintaining the integrity of the legal process itself. The need for a robust framework to regulate data use and protection in the context of AI judges cannot be ignored.

From this analysis, it is clear that while AI judges can offer some advantages in terms of efficiency, their implementation must seriously consider human rights principles. It is important to develop and implement AI in the legal system in a way that ensures that the resulting decisions conform to the principles of fairness, equality, transparency, and privacy protection while maintaining a balance between the benefits of technology and the need to maintain humanity and fairness in the judiciary.[39] The use of AI judges presents the potential for increased efficiency in the justice system but must be balanced with protecting human rights. It is important to ensure that AI not only follows the law in its written form but also adheres to the principles of justice, equality, and human dignity at the core of human rights.[40] It requires developing AI that is not only technically advanced but also sensitive to ethical, moral, and cultural aspects. In practice, this means establishing systems that allow for significant human oversight of decisions taken by AI, as well as transparency and appeal mechanisms that allow for the review

[39] Harry Surden, "Ethics of AI in Law: Basic Questions," in *The Oxford Handbook of Ethics of AI*, 2020.

[40] Eileen Donahoe and Megan Macduffee Metzger, "Artificial Intelligence and Human Rights," *Journal of Democracy* 30, no. 2 (2019).

of AI decisions by human judges.[41] In addition, data protection and privacy must be an integral part of the design and implementation of AI-based legal systems.

In adopting AI judges in the future, Indonesia should take lessons from other countries' experiences and adapt them to its unique national context. First, Indonesia needs to develop a robust legal framework that considers AI's ethical, moral, and technical aspects. It includes regulations on transparency, accountability, and data protection. Second, the approach to AI should be aligned with the values of Pancasila, ensuring that the application of this technology supports justice, equality, and national unity. Third, there needs to be investment in local capacity to develop, understand, and manage AI technologies, including training for legal professionals and technicians. Finally, it is important to engage civil society, academics, and legal experts in the AI dialogue, ensuring that these technologies' development is transparent and open to public discussion. This approach will ensure that Indonesia not only keeps up with global developments in AI technology but also integrates them in a way that considers the national social, cultural, and legal context. Applying AI judges in the Indonesian context, within the framework of Pancasila, should offer a unique perspective that combines technology with the nation's basic values. The five main tenets of Pancasila, the ideological foundation of Indonesia, are 'belief in the One True God', just and civilized humanity, Indonesian unity, democracy guided by wisdom in representation, and social justice for all Indonesians.

1. Belief in God Almighty
   In the context of the principle of belief in one God and the application of AI judges in Indonesia, the integration of spiritual and ethical values poses a significant challenge. While AI can provide advantages in terms of efficiency and objectivity, it is important to ensure that its use does not neglect deep religious and spiritual values, which are very important in Indonesian society. The principle of belief in one God emphasizes the importance of considering spiritual and ethical in all aspects of life, including in the justice system. The development and

[41] Bruno Lepri, Nuria Oliver, and Alex Pentland, "Ethical Machines: The Human-Centric Use of Artificial Intelligence," *IScience*, 2021.

application of AI in the legal system should take this principle into account, ensuring that the technology is not only state-of-the-art but also in harmony with the spiritual values of society.

2. Fair and civilized humanity
   In the application of AI in the field of justice in relation to the principle of fair and civilized humanity, AI has the potential to increase objectivity and reduce human bias and error. However, the use of AI must still consider human aspects, including empathy and understanding the unique social and cultural context in Indonesia. AI should be developed and applied in a way that focuses not only on technical aspects and legalities but also on a deep understanding of social and cultural dynamics. This human aspect is important to ensure that the legal system remains sensitive to the needs and social conditions of individuals and maintains the principle of civilized and inclusive justice.
3. Indonesian Unity
   In the context of the principle of Indonesian unity, the use of AI judges in the justice system should support unity and equality. It means ensuring that all citizens, regardless of their ethnic differences or socio-economic conditions, have equal and fair access to the justice system. The development of AI must take into account Indonesia's social and cultural diversity so as not to create disparities or inequalities in access to justice. The use of AI judges should be designed in such a way as to ensure that all individuals, regardless of background, can benefit fairly and equitably from this technology in legal proceedings, affirming the principle of unity that is at the core of Pancasila.
4. Democracy Led by Wisdom in Consultation and Representation
   In the context of the principle of democracy led by wisdom in consultation and representation, the use of AI in the legal field should support a thoughtful and fair decision-making process. AI can be a helpful tool in analyzing data and providing information, but human discretion and oversight remain critical. It ensures that decisions generated by AI are not only based on algorithms and data but also aligned with society's prevailing values and norms. AI integration should be done with local and

collective wisdom in mind so that it does not replace but complements existing decision-making processes.

5. Social justice for all Indonesian people
   In applying the principle of social justice for all Indonesians, the use of AI judges in the justice system must be designed to support the achievement of social justice. It means ensuring that all levels of society, regardless of socio-economic status, can access and utilize a more efficient and accurate justice system. It is important to ensure that AI technology is accessible and understandable to all Indonesians to not create inequalities in access to justice. It includes creating user-friendly interfaces and providing educational resources to help the public understand how AI works in a legal context.

Overall, integrating AI judges in Indonesia's justice system must be done carefully, ensuring that these technologies are used to complement, not replace, the principles of Pancasila. It requires a careful balance between the utilization of advanced technology and the maintenance of basic values that form the social and legal foundations of the country.

Conclusion

The interaction between AI and law is a complex and dynamic field involving various aspects, including technological advances, legal implications, ethical considerations, and changes in judicial systems worldwide. Legal recognition of AI entities, such as in the cases of Sofia in Saudi Arabia and Shibuya Mirai in Japan, has opened a new discourse on AI's legal rights and responsibilities, as well as its impact on society and the definition of humanity in a legal context.\ Different countries have taken different steps in integrating AI into their legal frameworks, reflecting the diversity of global approaches. It includes the use of AI for complex legal functions and the role of AI in legal education and practice. These advancements show how AI is a tool and an active player in the legal field. The integration of AI in the justice system, namely Judge AI, for example, as practised by countries such as China and Estonia, aims to increase efficiency, transparency, and objectivity in the legal system. However, this integration also brings challenges,

including issues of AI accountability, the risk of bias, and how to balance the technology with existing legal principles. In the context of human rights, the use of AI in the justice system must adhere to the principles of fairness, equality, transparency, and privacy. There are concerns that AI may be unable to understand and incorporate ethical and moral nuances in decision-making, which are important to ensure that substantive and procedural justice is achieved. For Indonesia, the future application of AI judges should align with the principles of Pancasila, which blends advanced technology with national values. It requires a robust legal framework, alignment with Pancasila values, investment in local capacity, and active public engagement. Overall, the interaction between AI and law offers opportunities to improve legal systems but also presents significant challenges. Each country's approach to integrating AI reflects its unique legal, cultural, and social context, and the integration journey is expected to continue to shape and redefine the legal and judicial landscape worldwide.

Suggestion

Integrating artificial intelligence (AI) into the judicial system requires clear and adaptive regulations to ensure successful implementation. These regulations must guarantee transparency, accountability, and fairness while addressing legal responsibilities to prevent risks such as algorithmic bias. The application of AI must adhere to fundamental human rights principles, including justice, equality, and data privacy, supported by establishing an independent ethics committee to oversee its proper implementation. Oversight and accountability mechanisms are essential, including evaluation procedures and appeal systems to review AI-generated decisions. Transparency in AI operations is crucial, requiring algorithm audits and the publication of their findings. Personal data protection must also be ensured through high-security standards to maintain public trust. Additionally, training for judges, lawyers, and technical personnel is necessary to optimize the use of AI in the legal system. Public participation and open dialogue with stakeholders, such as the community, academics, and legal practitioners, are vital to ensuring transparent and widely accepted policies. Implementing AI should align with the values of Pancasila and Indonesia's legal culture to reflect social justice. Investments in technological infrastructure, such as reliable

internet networks and adequate hardware, are also critical, including collaborations with global technology providers. With clear regulations and comprehensive support, AI can enhance efficiency, fairness, and access to legal services in Indonesia.

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