



Role of AI in the Judicial Process

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ABSTRACT

Artificial Intelligence (AI) is also transforming the judicial process because the application of tools has made the legal system more efficient, transparent, and accessible. Using AI-based predictive analytics, natural language processing, and chatbots, it is possible to simplify case management, conduct document reviews without human intervention, and conduct legal research more efficiently. The technologies will assist lawyers and judges working alongside other professionals in the courts in saving administrative costs and concentrating on making substantive decisions. Secondly, AI information analysis can help in detecting the pattern of cases, field of threat, and sentencing concerns, which can minimize the likelihood of the judicial decision being more uniform. Nevertheless, the greatest problems that emerge during the implementation of AI are justice, accountability, and the probability of algorithmic bias, which can disrupt judicial independence. The implementation thus needs to be controlled properly and under the control of human beings. Overall, AI can be a significant source of judicial modernization, although it must be applied conscientiously so that it is not just fair but novel.

Keywords: challenges, historical context, laws, opportunities, theoretical context

INTRODUCTION

The primary issues that are applied by the judicial process are justice, right protection, and the rule of law (Drakokhrust & Martsenko, 2022). However, many cases have to be decided on; case trials are delayed, not accessible, and inefficient in courts worldwide. In this regard, the implementation of Artificial Intelligence (AI) has turned out to be a ground-breaking component in the legal systems (Yalcin et al., 2023). Artificial intelligence (AI) tools like natural language processing, predictive models, and automated legal research systems are being developed to make the court processes easier and to enhance the decision-making process (Putra et al., 2023). Not only do the innovations hasten the repetitive clerical work, but they also allow the legal practitioners and judges to focus on the more substantive aspects of justice administration (Nouri et al., 2024). Improving the trial efficiency of criminal cases with the assistance of artificial intelligence

AI is now being applied worldwide in diverse forms, with digital case management systems, advanced algorithms that predict case outcomes and sentencing trends (Gorlamudiveti & Sethu, 2023). Using machine learning models to go through large volumes of legal precedent, which would take several few seconds, can provide some insight that could help lawyers and judges, as an example (Chen, 2025). Moreover, AI-powered programs can also improve access to justice since they offer legal services (through chatbots and online services) to individuals who cannot afford to hire counsel (Vargas-Murillo et al., 2024).

Nevertheless, the use of AI in the judicial process does not create any. Problems with transparency, algorithmic bias, moral responsibility, and ensuring judicial independence are controversial topics (Benyekhlef & Zhu, 2024). Even though AI can introduce gigantic possibilities to change the justice system, its application must be heavily regulated to ensure fairness and adhere to the key values of the law (Gentile, 2022). Thus, the application of AI to the court process is a valuable domain that should be researched regarding the opportunities and limitations of AI (Indriasari et al., 2025).

Research Justification

Applications of Artificial Intelligence (AI) in the judicial process are explained by the increased necessity to tackle inefficiencies, delays, and barriers to justice that remain an issue within legal systems across the global scope. Many countries, such as Pakistan, have a heavy case backlog, slow case adjudication, and poor access that affect marginalized communities in their courts. The technologies can be used to solve the problem of AI and offer solutions such as case management, legal research, and affordable legal services. It is, therefore, important to analyze its contribution to finding out how such tools can aid in the delivery of justice more fairly and efficiently.

Besides, AI is not a fanciful idea but a new reality in the legal practice. Most jurisdictions have started testing predictive analytics, automated records, and virtual legal systems. Nevertheless, the issue of bias, ethical responsibility, and maintenance of judicial autonomy also pose pertinent issues to consider scholarly. This study is

important as it underscores the potential and danger of introducing AI to the judicial system so that innovation does not undermine fairness and human rights. Through this topic, the research can be used in coming up with enlightened policies, models, and principles that can enable a harmonious relationship between the growth of technology and the basic tenet of justice.

Research Objectives

1. To discuss the historical context of AI's role in the judicial process.
2. To highlight the theoretical context of AI's role in the judicial process.
3. To analyze the laws regarding the role of AI in the judicial process.
4. To identify the key challenges regarding AI in the judicial process.
5. To explore the opportunities for the role of AI in the judicial process.
6. To propose effective prevention and intervention strategies.

RESEARCH METHODOLOGY

This study employed a systematic review methodology, with research objectives established accordingly. A comprehensive literature review was conducted (Komba & Lwoga, 2020). Research findings were categorized based on their content (Hiver et al., 2021; Petticrew & Roberts, 2006), and classified information was incorporated into the study by organizing it into headings (Gan et al., 2021; Pawson et al., 2005). The evaluation of classified information and titles formed the basis of the study (Page, 2021; Rahi, 2017), ensuring the integrity of the research subject and its contents (Egger et al., 2022; Victor, 2008). The criteria for selection are listed.

1. **Relevance:** Research that directly addressed the questions posed by this study is included.
2. **Quality:** Studies that meet a certain quality threshold (e.g., methodological rigor, bias risk) are included. Most of the research is from Scopus-indexed and Clarivate Analytics journals and reputed publishers.
3. **Recency:** Consideration of the publication date to ensure that the review reflects the most current evidence. Most of the studies are from the last three years.
4. **Language:** Only studies published in English are included.
5. **Data Completeness:** Previous studies must provide sufficient data on outcomes of interest for practical synthesis; this is also ensured in this research.

This study did not use primary data from human participants; therefore, no ethics clearance letter from the ethics committee was required.

LITERATURE REVIEW

Artificial Intelligence (AI) has already captured the interest of considerable attention in legal studies because of its ability to revolutionize the legal process significantly (Chen, 2025). The use of case prediction, legal research, and automation of administration is among the areas where its use is emphasized in the current literature (Drakokhrust & Martsenko, 2022). According to Bharati (2024), AI-related technologies also ensure that courts and lawyers can process large amounts of legal

data faster and more precisely, which reduces the number of time-consuming processes (Nouri et al., 2024). Putra et al. (2023) examine the prospects and challenges of deploying AI “judges” in Indonesia’s criminal justice system, arguing that AI can improve efficiency and transparency but raises serious accountability, bias, legal and ethical, and human-rights concerns. These articles draw attention to the possibilities of AI to enhance the legal system in the field of uniformity and efficiency. The other topic that scholars research is the possibility of using AI to improve access to justice (Yalcin et al., 2023). Legal knowledge is made more accessible to low-income groups through AI-based systems, such as chatbots, legal advice websites, etc., thereby eradicating socio-economic inequality (Gorlamudiveti & Sethu, 2023).

Moreover, Gentile (2022) indicates that predictive analytics can be useful in managing court caseloads, minimizing delays, and delivering justice more promptly. Despite these merits, significant concerns are critically discussed in the literature, particularly regarding algorithmic transparency, where the opacity of decision-making processes in artificial intelligence systems may hinder accountability. Problems of systemic bias, impartiality, and the potential loss of judicial autonomy are tropes (Vargas-Murillo et al., 2024). One of the ethical concerns, as presented, is the excessive use of AI in such sensitive justice domains where it is impossible to replace human judgment. Overall, the analyzed literature gives quite a balanced picture. AI can be seen as a highly powerful tool, which can have transformative potential, but in a wary manner (Indriasari et al., 2025). It is still emphasized by researchers that there should be good regulatory measures, ethical protection, and human control so that AI may not displace but complement judicial decision-making. All this newly acquired knowledge is a strong foundation in the exploration of the way AI is transforming the judicial process (Benyekhlef & Zhu, 2024).

Historical Context of the Role of Artificial Intelligence in Judicial Process

The use of technology in court proceedings is not new to the history of Artificial Intelligence (AI) (Chen, 2025). First, courts used manual filing systems and, therefore, were prone to inefficiency and delays (Benyekhlef & Zhu, 2024). The first significant shift was the introduction of computerization in the late 20th century, when digital databases were introduced in case management and legal research (Drakokhrust & Martsenko, 2022). Online legal repositories such as LexisNexis and Westlaw gained statutes, case laws, and precedents at a faster pace, and this transformed the legal research process (Nouri et al., 2024).

With the internet expansion, there was the introduction of e-filing and digital case management systems in the courts. These technologies contributed to a substantial decrease in paperwork and enhanced efficiency, and set the basis of AI-based solutions (Putra et al. 2023). In the early 2000s, expert systems in law came into existence, and they are supposed to give rule-guided legal advice (Yalcin et al., 2023). Though small in scale, they proved the possibility of making certain aspects of the legal process automated (Gorlamudiveti & Sethu, 2023).

Over the past few decades, thanks to the accelerating development of

machine learning, natural language processing, and big data analytics (Gentile, 2022). AI can increasingly take a more proactive part in judicial systems (Vargas-Murillo et al., 2024). The United States, China, and Estonia are some of the countries that have started testing AI-related case prediction. Such development is the continuation of a long history of technological incorporation, and AI is the next level of modernizing the process of justice delivery (Indriasari et al., 2025).

Theoretical Context of the Role of Artificial Intelligence in the Judicial Process

The use of Artificial Intelligence (AI) in judicial proceedings can be evaluated in the context of several theoretical frameworks, which point to its potential and challenges. A socio-legal theory is one of the applicable frameworks that focuses on the interaction between law and society and the changing technologies.

AI is not a technical object but rather a social phenomenon that changes the access to justice, decision-making processes, and the trust people have in the judiciary. The other helpful lens is legal realism, which states that courts of law do not make decisions only according to legal regulations, but also with references to social, political, and personal conditions.

The predictive instruments of AI are consistent with this theory because they try to measure the trends in judicial cognition, although some critics believe that such a system can neglect the human dimension of justice. The technology acceptance model (TAM) also gives a deeper understanding of the use of AI tools by legal professionals and institutions. Perceived usefulness, ease of use, and trust in technology are elements that enable acceptance, and thus, transparency and accountability in AI systems are crucial. Lastly, ethical and governance systems are essential for gauging impartiality, discrimination, and human control in AI-aided decision-making. All of these theoretical points emphasize the idea that, as efficient as AI is, the implementation should be accompanied by a balance between its application and human discretion, ethical considerations, and justice principles.

Laws Regarding the Role of Artificial Intelligence in the Judicial Process

1. **European Union AI Act (2021):** The EU has already provided a full set of laws according to which AI applications can be segmented into risk categories. The judgments that the judiciary makes should be listed as a high-risk list that should be well monitored, transparent, and accountable.
2. **UNESCO Recommendation on the Ethics of AI (2021):** This is an international standard that is concerned with equality and human rights, as well as moral safety. It requires that the use of AI should not violate judicial independence or equality before the law.
3. **US AI Investments:** There is no federal law regulating AI in the United States, but there are laws and regulations on fairness, data usage, and disclosure of AI systems (some of which are applied to legal applications), such as the Algorithmic Accountability Act and the National Institute of Standards and Technology (NIST) standards.
4. **The Chinese AI Governance Regulations (2019-2022):** China has issued the national governance principles on AI, the emphasis of which is on security,

accountability, and state control. There are already legal frameworks on the state level, and in the judicial sphere, AI is already used in smart courts to handle cases.

5. **Pakistan National AI Policy (Draft 2022):** To bring AI to the government, Pakistan has unveiled its Digital Pakistan Vision and National AI Policy. Nevertheless, the judiciary had no special legal provisions available to it, which explains why stronger regulatory frameworks have to be created.

Challenges for the Role of Artificial Intelligence in the Judicial Process

1. **Algorithms may be biased or fair,** and can affect the interaction of people with machines and vice versa. One of the biggest problems is the potential bias of the AI systems. The algorithms can recreate the biases that were present before and, as such, can be utilized to produce unfair decisions or promote inequalities in the court verdicts.
2. **Lack of visibility (Black Box Problem):** The systems of artificial intelligence are often black boxes, and the logic of any decision made cannot be easily described. It will not help in accountability, and it will reduce trust in the judicial system as far as judicial processes are concerned. Issues on
3. **Data Privacy and Data Security:** Making criminal procedures involves personal information. The use of AI has risks relating to the abuse of, violation of, or illegal access to the information that can compromise the privacy of individuals.
4. **Legal and Ethical Gray Area:** Even in most states like Pakistan, there is no clear legislation that regulates AI in the judicial sector. The question of liability, moral obligation, and human agency cannot be resolved without some well-developed legal frameworks.
5. **There is no acceptance of Adoption and Capacity problems:** The judges, court personnel, and lawyers may be opposed to the introduction of AI due to a lack of training, fear of losing their jobs, or due to a lack of certainty of reliability. Moreover, the majority of legal systems have resource and infrastructural issues that limit the effective implementation of AI.

Opportunities for the Role of AI in the Judicial Process

1. **Efficient Case Management:** A lot of the backlog of cases is automatable through AI working on the administration side, e-filing, definition of hearings, and surveillance of case events. It can assist the courts in going through huge cases.
2. **Enhanced Legal Research:** AI-powered tools can include natural language processing and predictive analytics that can filter through thousands of previous cases and laws in just a few seconds, allowing judges and attorneys to rely on AI-powered tools. It improves the quality of the law reasoning and reduces the research time.
3. **Judicial Unanimity:** AI can also be implemented to offer consistency and reduce the variation of sentencing or decision-making by identifying trends between past rulings. It contributes to the impartiality and predictability of the justice system.
4. **Improved Access to Justice:** Such persons can receive basic legal advice with the

assistance of AI-driven chatbots and online advisories, which are inaccessible to full-time lawyers. It brings more inclusiveness, and the marginalized groups seek legal help.

5. **Data-Driven Policy:** Making AI can investigate judicial systems, delays, and dockets trends; these can be very beneficial concerning changes. It can inform policymakers to design more effective legal systems and allocate resources most effectively.

DISCUSSION

Both opportunities and challenges are present in the adoption of Artificial Intelligence (AI) in the judicial process. On the one hand, AI is highly efficient and offers more options that have not been available before due to its automation of routine activities, simplification of case management, and improvement of legal research. It can enhance consistency of decisions by offering a consistent review of previous judicial rulings, and AI solutions can make justice more readily available to underserved groups. With these opportunities, it is clear that AI can be used to reinvent judicial systems into more inclusive, transparent, and efficient institutions. Conversely, the risks are also ignorable. Algorithms, the absence of transparency, and poor regulatory frameworks can undermine fairness and judicial independence. Accountability, privacy, and human oversight are ethical dilemmas that are yet to be resolved. In this way, AI can help to modernize the legal system, but its advantages should be offset by these vital issues. To make sure that justice is not undermined, a more conservative strategy that integrates technological invention, as well as ethical protection and effective governance, is needed.

CONCLUSION

Artificial Intelligence has come as a revolutionary powerhouse in the legal system that has provided solutions to the long-standing issues like case backlog, inefficiencies, and obstacles to justice. Its use in legal studies, case administration, and access to justice underscores its ability to empower the judicial systems. Nonetheless, the threats of bias, transparency, and accountability require strict control and human supervision. AI is not to substitute the judicial reasoning, but instead it serves as an assistant. The need to be fair, transparent, and responsible will enable the modernization of the judiciary without taking away the principles of justice.

Recommendations

1. **Create a Solid AI Law:** Governments should implement explicit laws that would direct the use of AI in the courts, and thus hold the concerned parties accountable and fair.
2. **Be transparent:** The AI used in a courtroom should provide explainable results since the black box problem is not acceptable, and all must trust the objects.
3. **Defend Data:** Good policies should ensure that data that is of legal concern does not find its way into the wrong hands of criminals, abusers, or hackers.

4. **More Human Surveillance:** AI is not to assist in the substitution of judges. There will be no legal decision-making that is not founded on the judgment of humans.
5. **Deal with Algorithmic Bias:** One should regularly audit and ethically review AI systems to reduce bias in them.
6. **Education and Training:** Judiciary, lawyers, and other court workers must receive education to utilize AI technologies appropriately.
7. **Pilot Projects before Implementation:** AI implementation in courts must be introduced on a gradual basis with pilot projects to identify efficiency and address challenges.
8. **Expand access to Justice:** AI-based systems such as chatbots in legal services should be designed to serve low-income and marginalized people.
9. **International Cooperation:** States should share best practices and converge on AI standards across legal systems globally.
10. **Continuous Monitoring and Evaluation:** Systems should be established to review regularly the performance of AI, its compliance with ethics, and the impact of AI on the delivery of justice.

Research Limitations

Even though this analysis emphasizes the significance of Artificial Intelligence (AI) in the court, the study has limitations. First, the research depends heavily on secondary information sources such as scholarly articles, policy reports, and case study reports, which may not necessarily represent the contemporary judicial practice, especially in developing countries. Second, the rapid evolution of AI technologies means that some of the findings will become outdated in the near future since new technologies and regulations will emerge. Third, country-specific information is not easily obtained, in particular,

In Pakistan, AI is still in its infancy in the judiciary. Fourth, the study does not provide primary views of judges, lawyers, and policymakers and, thus, could use additional information about practical problems and possibilities. Lastly, results might not be applicable because of cultural, ethical, and legal differences across jurisdictions. The limitations are what make it so that engaged research, continuing, context-specific, and empirical studies are needed in this field.

Research Implications

1. **Policy Development:** The findings can be used by policymakers to design viable legislation that is equitable, clear, and responsible in the application of AI in the courts.
2. **Judicial Reforms:** The courts can take the experience of this research to restructure their approach to handling cases and clear the backlog with the help of AI.
3. **Ethical Guarantees:** The study suggests that there should be ethical provisions that reduce the bias of algorithms and ensure the independence of the judiciary.
4. **Access to Justice:** The policymakers could champion the use of AI-based tools, including legal chatbots, to provide inexpensive access to legal advice to the disadvantaged categories.

5. **Comparative Studies:** The study provides a platform on which comparisons between jurisdictions could be drawn, on which countries could learn based on the best practices across the world.

Future Research Directions

1. **Empirical Studies:** Future research should collect primary information among the judges, lawyers, and litigants to comprehend the practical issues and opinions regarding AI in the courts.
2. **Case-Specific Analysis:** Studies can be carried out on how AI will perform on different types of cases, such as civil, criminal, and family law, to ascertain where it can be used and where it is warranted.
3. **Algorithmic visibility:** It requires more research on the creation of explainable AI models that will raise the level of trust and responsibility in the court.
4. **Comparative Jurisdictional Studies:** The analysis of the application of AI in developing and developed nations will offer information concerning good practices and peculiarities of the situation.
5. **Ethical and Legal Frameworks:** Scientists are expected to examine how the legal structures and ethics may be redesigned to accommodate fairness, prejudice, and liability in AI-assisted.

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