

Received: 11 August 2023, Accepted: 15 October 2023

DOI: <https://doi.org/10.33182/rr.vx8i4.316>

An Exploratory Research to Analyze Scope of AI-Integration in Legal System and its Probable Challenges with the Way Forward

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Abstract

In this era of technological revolution, role and incorporation of Artificial Intelligence cannot be denied in any field of life. Use of AI has facilitated human beings in their routine work with increased precision, accuracy and efficacy in managing and regulating the things. From detection and treatment of disease in healthcare profession to detection of financial frauds and conversion of man-driven vehicles to autonomous automobiles, the AI has transformed our lives. Judiciary is not an exception to this rapidly increasing AI-incorporated practices. It is being observed that Artificial Intelligence is also being integrated in routine judicial tasks including administrative as well as procedural work. This research paper is intended to highlight the scope of AI in the legal system, to explore innovative tools and applications which can be employed and to identify specific areas where regular functions of the system can be improvised through this advanced technology. At the end of the research, a few drawbacks have also been pointed out which may create challenges if not addressed properly. Qualitative research methodology has been used with analytical approach and the relevant information has been collected from secondary sources. The research has been concluded signifying the importance of seeking assistance from Artificial Intelligence in order to increase efficiency and expediency of judicial system, along with certain solution to minimize the risk factors.

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Key Words: Artificial Intelligence (AI), Legal System, Criminal Risk Assessment, E-Discovery, Robot Judges, Generative AI, Predictive Analytics, AI-powered Tools, Challenges

1. Introduction

We are living in the era of revolutionary advancements for which credit goes to research and innovation in technology. A few centuries ago, no one had ever given a single thought of flying in the air, travelling to the moon, curing tumors without surgery, education through distance learning (e-education), weather forecast and artificial rains, modern technology for communication and swift correspondence, meeting and collaborations through audio-visual calls from thousands miles distance, live location sharing and tracking, security and surveillance through modern devices and computer assisted administrative work (Craig, Laskowski, & Tucci, 2024).

In the history of evolution of mankind it can be established that the progress has no end ever and after few decades a new revolution is being witnessed. Artificial Intelligence is playing its robust role in the present time which is changing dimensions of working from physical to cyber landscape (IBM, 2024). It is the technology which is enabling computers to imitate human intelligence and their problem-solving capabilities (IBM, 2024).

Artificial intelligence is a field of science which relates to the functioning of computers and machines involving reasoning, learning and acting in a manner that would normally need human brain and intelligence with the data at the scale higher than what human can analyze. AI applications include expert systems, natural language processing (NLP), speech recognition and machine vision (Craig, Laskowski, & Tucci, 2024).

AI is actually the duplication of human intelligence into machines which perform tasks through algorithm and data processing (Telereleation, 2024). Emerging scope of AI can be evidenced from the fact of its incorporation in various fields of life including health, education, IT, engineering etc. Career pathways are being carved in sciences, research, cyber security, data analysis, transport, medicine where the professionals are enhancing their abilities of using their AI skills

and utilizing their acquired knowledge for the welfare of their society and mankind (Chitkara University, 2022).

Artificial intelligence has emerged as a ground-breaking tool which has reshaped industries, streamlined processes and improved decision-making and its scope cannot be denied in the field of judiciary as well (Marwala, 2024). Judiciary is considered as the major “text processing industry” as the whole judicial and legal work depends on language, documents and texts which serve as raw material for the investigators, lawyers and judges to develop relevancy of certain facts and circumstances with any particular case or situation to observe that, how justice is served (Schindler, 2024).

Artificial Intelligence is in existence since decades but the recent developments have made the legal professionals to think whether they can integrate the AI-powered tools for reshaping legal practice starting from the documentation, investigation, trial, litigation till the last step of judicial decision. The success of AI is attributed to its data storage, and its management and analysis with adequate computational structure. Now it is being explored that use of AI is increasing not only in the fields related to traditional judiciary and prosecution but also in alternative dispute resolution (ADR) as AI system is being adopted for seeking assistance in investigation and automated decision-making (UNESCO, 2024).

The objective of this research is to identify the significant AI innovations which have been or can be used in the field of law. This study has been conducted to explore different areas of legal system which can be well-facilitated through AI tools and software and to explore how AI can effectively be used to help lawyers, judges and clients. This research is intended not only to highlight the significance of AI integration in legal profession but also to expose certain challenges connected with this novelty which are needed to be monitored and addressed to obtain maximum benefit.

2. What is Generative AI Tools and Machine Learning?

A generative AI tool is characterized by producing “output” as a response to the instructions from the users which are called “input” or “prompt”. The output generated depends upon the data stored in the system and could be in any form including text, image, music etc. In 2022, launch of *ChatGPT* provided a new tool with rules and technological developments but associated with fears of hallucination, bias and inaccuracies (McKinsey & Company, 2024). Artificial Intelligence is basically the description of technology which creates human-like behavior and responses by creating intelligence through computers and software which are mostly in our common usage but we do not pay attention to it. *Siri, Alexa, Google search, online shopping, purchasing history, Google travel history, and geo fencing* all involve use of AI, and machine learning algorithm.

AI is a term which works under the ambit of Machine Learning (ML). In technology based automated legal processes, computers and software frequently incorporate AI in the form of ML that improves the legal work by performing specific tasks over certain period making the process more expedient. ML is basically of three types: *i) Supervised ML* which involves the application of AI for indentifying patters within predefined data sets which have been created under human supervision who act as the guides for machine working (Coursera, 2024); *ii) Unsupervised Machine Learning* that creates data sets on its own without predefined data or known outputs and is not under the supervision and control of any human being, the software learns and responds on its own (Kanade, 2022); and *iii) Reinforcement Learning* is the type of ML which trains the software for providing most optimal results and mimics using trial-and-error process of learning for achieving human goals (AWS, 2024).

The lawyers need more accuracy in their work, precision and promptness in their draft briefs and quick analysis of the massive amount of data to unearth some specific information which is hidden from the human eye and can be unearth through generative AI for which the supervised machine learning tool is the most suitable solution for legal professionals. This is because it offers faster research and reduced risk of inaccuracies or missing documents with an easy

access to reliable data on which the lawyers can trust for contesting their cases (Bloomberg Law, 2024).

3. Exploratory Analysis of Areas of Legal System to Integrate AI-powered Tools

This research has particularly been designed to explore different areas of legal system which can be reformed through AI. This part of study involves discussion of the subject matter in detail giving a brief account of the aspects of legal profession where AI-powered tools can be incorporated. It is also demonstrating different applications which have been formulated and invented in this regard. After going through this analysis it would be clearly established that the legal system can be remarkably improved with this technological achievement.

3.1 Documentation and Legal Research

AI-driven research tool is being used for quick analysis of extensive legal database, entailing the utilization of *chatbots* and *virtual assistance*, providing attorneys and individuals with legal guidance and accessibility to legal information (Marwala, 2024). Likewise, *document automation tools* are facilitating in saving time and money by producing documents in more efficient and accurate manner. Lawyers are using generative AI tools and are seeking assistance from *ChatGPT* for drafting legal documents in legal language and expression specifically the written contracts, leases and wills (Bloomberg Law, 2024). Other than *ChatGPT*, the AI-powered software and tools being widely used in legal documentation are *IronClad*, *Genie AI*, *Robin AL*, *Juro*, *Carilis*, *Spellbook*, *Grammarly* etc. which are helping through contract review, document automation, voice assistance for dictation, language translation and document management (BIICL, 2023).

AI-powered *Draft Analyzer* tool guides the lawyers using various ML models about the language of the document and identifies when it is deviating from the standards of the market or those which are required by the counterparty (Bloomberg Law, 2024). *AI-powered contract*

management tool in combination with *AI generated language models* can also protect lawyers from tedious work of preparing documents manually diverting the process to automated system of contract management which automatically imports the required information relating to involved parties, important data, general obligations and payment terms from the stored information (Dang, 2024). It has also enhanced feasibility for attorneys by reviewing the document digitally, thus saving their time from spending on contract analysis and allowing the teams to focus on other strategic tasks and negotiating with the clients (Dang, 2024).

Along with managing documentary data, another common use of AI is in *electronic discovery (e-Discovery)* process of documents from *electronically stored information* (ESI) which is termed in emails, database, presentations, voicemail, audios, videos, social media content, and websites etc. The lawyers can easily reach their required document through this software more efficiently by using its advanced capabilities e.g. algorithm, machine learning applications, process automation and text analytics (Bloomberg Law, 2024).

Profession of law involves dealings of lawyers with clients in several aspects shouldering various responsibilities regarding case handling, from initial stage of their being hired by the client till the disposal of the case by the court. Every stage requires provision of services basing on brainstorming and reasoning for which the lawyers have to definitely resort to several enactments, judicial precedents and relevant information regarding the issue involved available at national and often at international level.

AI is assisting the lawyers in legal research as well by aiding them in collecting relevant information on some point of law through single click. Without adopting advanced research technologies, the lawyers have to spend most of the time in searching and reading the literature to find the court's opinion in similar situations and the applicable law. Now, AI has made all the information conveniently available through its database, which has not only saved the time of the lawyers but has also helped them in developing their expert advices and opinions for their clients and preparing their arguments to present in the court basing on the material which is globally available.

Generative AI is not only lending a hand in rendering valuable advices to the clients and determining the fate of the case but has also improved the standards and quality of decisions delivered by the courts by providing judges an opportunity to enhance their legal prowess by getting aware of the recent global trends and legal progress. *Pakistan Law Site* is providing all the data about the cases since inception of Pakistan, which is providing an easy access to all the judicial precedents as well as the statutes. *LexisNexis*, *Westlaw*, *Thomas Reuters's AI tool Westlaw Precision*, *Casetext*, *Harvey*, *Law Notion* and many others are helping in providing legal review, answering legal questions, executing tasks and generating summaries on the basis of information collected from multiple jurisdictions (BIICL, 2023)

3.2 Workflow Optimization and strategic Planning for Lawyers through Predictive Analytics

Predictive analytics is enabling attorneys and litigants in making well informed decisions by forecasting legal outcomes and the likelihood of losing or winning the case. It is also helping in undertaking contract analysis for calculation and assessment of potential risks. AI incorporation can help in assessing the strengths and weaknesses of the matter and to formulate the strategic plans accordingly, as to adoption of the most appropriate mode for resolving dispute from amongst settlement, negotiation or litigation (R, 2024). Applying this technology can also assist in analysis of historical data, prediction of legal cost and consumable time length, protection of firm reputation by identifying patterns and correlations in legal documentation and communication records (R, 2024). Following table has been provided for detailed overview about impact of predictive analytics in the field of law and its future trends (R, 2024).

Traditional Legal Case Prediction VS AI-Powered Predictive Analytics For Case Prediction

Aspect	Traditional Legal Case Prediction	AI-Powered Predictive Analytics for Case Prediction
Data Handling	Relies on manual analysis of case precedents and legal texts	Utilizes large datasets and advanced algorithms to analyze extensive legal data
Accuracy and Consistency	Subject to human error and bias; consistency can vary	Offers high accuracy and consistency by leveraging machine learning models
Speed and Efficiency	Time-consuming due to manual research and analysis	Rapid analysis and predictions due to automated data processing
Scope of Analysis	Limited to human capability; usually focuses on a smaller subset of cases	Can analyze vast amounts of data including past cases, statutes, and regulations
Adaptability	Less adaptable to new information and changes in legal standards	Continuously learns and adapts to new data, improving over time
Cost and Resources	High cost in terms of time and human resources	Cost-effective in the long run with reduced need for extensive human resources

3.3 Criminal Risk Assessment

Use of *Artificial Intelligence-based criminal risk assessment programs* is one of the fundamental advanced approaches adopted by the courts to determine certain risks about the offenders in criminal matters (In re Humphrey, 2021). The judicial officer has to decide in criminal cases *firstly*, whether a person will remain in jail during the period awaiting trial and *secondly* whether he should be remanded to custody after pronouncement of sentence (In re Humphrey, 2021). The pretrial decision of the court about detention or release of a person depends on determination of the likelihood of appearance of that person before the court when required and the danger posed to public safety if that person is not detained whereas after trial the decision of the court to grant probation entirely depends upon the assessment of risk to public safety (In re Humphrey, 2021).

Judges have to rationally calculate the risk to public safety and society to determine whether to send the person home on probation or to prison. In *Humphrey* (In re Humphrey, 2021) and

White (In re *White*, 2020), the Supreme Court of California applied the provisions of the California Constitution (The California Constitution, Art 1 Sec 12 & 28) and the US Constitution holding that a person can be released on bail or otherwise except in the matters involving capital punishment, cases of violence or sexual offences and in felony offences because in such matters there is likelihood of carrying out bodily harm.

In both, pretrial detention and sentencing, the judge pronounces the decision weighing the risk to public safety on the basis of the available evidence and previous criminal record in which technology is helping a lot by assisting law enforcement work initially by managing criminal records and then through preparation and presentation of evidence during trial using AI programs including probabilistic genotyping (Thompson, 2023), predictive policing (profiling), facial recognition, and other machine-based processes (Almeida, Shmarko, & Lomas, 2021).

The decisions of the judges regarding criminal risk assessment by using AI risk assessment “tools” or “instruments” is always based upon the data and input available in the system, the certainty and accuracy of which can be doubted in several aspects. The program can be helpful in the matters involving recidivism, habitual offenders, sexual offences, serial killing etc. but the decisions pronounced by the judges cannot be substituted with AI generated orders which would lack the use of discretion and will make the same decisions in the like matters without considering the other associated circumstances. However, the significance of AI in assisting and guiding the court cannot be denied in deciding the cases on the basis of evidence available through AI database (Sanger, 2024).

3.4 Virtual Assistance, Advisory Services, Expertise Automation

AI has made the things more convenient and workable saving time and money of legal professionals as well as the clients through virtual communication. Automated information available through AI-powered tools help in addressing recurring questions, scheduling appointments, handling clients routine inquiries, and weighing factors with decision trees thus facilitating client communication and support by updating them with the necessary information

for their satisfaction and building trust relation with their counsel. *Legal Chatbots* answer frequent questions of the website visitors providing them immediate information (BIICL, 2023).

It is due to generative AI and its various tools and software that the lawyers are able to deliver prompt services to their clients and advise them efficiently on the basis of valid grounds which they themselves can search through AI-powered tools which have the ability to analyze large amounts of data and interpret complex legal concepts (Clio, 2024). It has also enhanced the credibility and integrity of legal profession and the lawyers are more conscious to provide exact and beneficial guidance to their clients as it can be again cross checked evaluating the available information through advanced AI technology (Ahmed, Fatima, & Abbas, 2024). Technological awareness has been proliferated more than that existing previously, so clients are consciously expecting fair and unbiased dealings and professional assistance for their good cause.

Provision of *virtual assistance* also satisfies the clients that their work is being done with efficacy and without delay. Law firms also hire virtual assistants who work remotely for their organizations and complete their assigned tasks irrespective, from where they belong to. They perform functions of administrative nature as well as manage and maintain routine official tasks (OSSISTO, 2023). It has also opened opportunities of seeking virtual assistance from the experts belonging to other jurisdictions and to seek their help on certain points of law or procedure or other connected matters.

Legal Tech Ecosystem is running on the basis of Human-AI collaboration. AI-powered virtual assistant has now been introduced, one example of which is *Casetext* and the other is *CoCounsel* which has recently been launched and has the ability to assist the attorney in the same way as a junior assistant can, addressing all the queries regarding matters of the firm pending in the court, management of case details and files, legal research, and information about the schedules. This AI product is available based on large language models which is the most significant feature of it (Villasenor, 2023).

3.5 AI-driven Smart Courts and Online Dispute Resolution (ODR)

Current use of AI in legal industry is mostly being operated behind the scene but it is exhibited into the frontline in the courtroom (Curry, 2023). AI-powered courts are being considered to be an innovation in the disposition of cases providing efficient relief to the litigants, facilitating multijurisdictional issues at any decided place without physical presence of all the parties making it more convenient and less expensive and the most importantly, managing the backlog of cases.

Some of the commonly used AI applications in the courts are online dispute resolution (ODR), differential case management (DCM), E-filing documents, risk assessment, compliance monitoring, calendar management, litigant portals and content, voice and handwriting recognition, data extraction and redaction and robotics (Meyer, 2018). In many countries “*Smart Courts*” have been established where litigants file their cases online and get their issues resolve via digital court hearing (Vasdani, 2020).

Hangzhou Internet Court of China, which was established in 2017, introduced a court system without human judges where the procedure is run by the AI judges who appear by hologram and are artificial creations but look like real persons having synthesized 3D images. They schedule cases, conduct hearings, ask questions, record evidence and pronouncement judgments (Wang, 2020). Canada, Germany, France Croatia and many other countries are also using AI assisted courts particularly in the matters which are not involving complexities (Vasdani, 2020).

Use of AI in criminal courts is more robust than in civil courts as the information and guidance required to decide criminal matters is more accurately and conveniently available through information system, stored data, digitalization of record etc. The decisions regarding bail and sentencing can be effectively delivered assessing the risk factors on the basis of evidence which is available through technologically or AI-powered tools and software (Meyer, 2018). AI generated decisions require a large amount of data for efficient and accurate decision-making. The structured information must be consisting of decided cases, applicable law, e-document database and strong evidentiary details (Reiling, 2020).

Online dispute resolution through integration of AI is also providing an alternative to conventional litigation facilitating the parties residing at distance to come up to an amicable solution in more efficient and effective way (Vasdani, 2020). The Great Britain, the Netherlands and Latvia are few of the countries that have employed such automated solutions particularly for cross-border disputes which is regulated by the common framework set up by the European Union and is available on the internet (European Small Claims) (Council of Europe Portal, 2024).

4. Probable Challenges with Way Forward

It is an established fact that man is relying on advanced technology, incorporating and depending on it for his routine tasks due to its countless benefits. AI integrated legal system has a great potential to serve the humanity through prompt access to justice but it is connected with several concerns and challenges which need to be addressed to achieve the desired results. Everything has its pros and cons the same is with the advanced technology. There is difference between Devine-Creation and Man-Made technology as the things designed and produced by the human beings can never be characterized as perfect and flawless.

1. Men with exceptional talent and skills have produced machines and instruments to facilitate mankind nonetheless they are the creation of human brain which can show errors and can be interfered through malicious acts and malwares created by some other human brains causing data hackings, technical glitches, etc. Therefore, it cannot be fully relied upon without supervision and vigilant use by the experts to avoid any harmful effects or results of man-made achievements. There must be a backup plan to avoid the permanent loss to the stored information.
2. The legal industry has started the use of AI from scratches which will take years to reshape it in more organized and structured manner. It has the tendency to improve productivity, lessen prejudices and offer insights but at the same time it involves several moral and ethical issues. Data privacy, data protection and cyber-security must be ensured while digitalizing the legal records. This sensitive transformation must be through application of advanced security system. AI has the potential to accelerate legal

system in more effective and prompt way but the process involves several ethical concerns and obstacles. It must be viewed as an enhancement to augment legal process and not as a replacement.

3. Every state promises the right to fair trial through impartiality and independence of court which can be compromised by the use of AI generated decisions because it limits the human interference and the decisions are based on the facts and information available and stored in the system. It may result into similarity of decisions as the AI or Robot judges will not be able to apply their judicial minds to observe variation in physical circumstances, different situations, *pleas*, *mens rea*, or *actus rea* and to decide the matter using their discretion. Moreover, it will also limitise the innovation of judicial rulings and precedents due to identical decisions in every matter.
4. Major challenges connected with integration of AI in legal system involve the concerns of data privacy, complexity of legal issues and lack of technical expertise. Integration of AI in legal system is inevitable but there must be a proper regulatory framework to provide guidelines regarding addressing ethical issues and other challenges. Lawyers are ethically and legally bound to ensure the confidentiality of client's information and are not required to disclose it or to give access of the system to any unauthorized person.
5. Developers of AI tools, software and applications to be integrated in legal system must also have adequate knowledge about law and an understanding about the nature of information to be built in the system. Negligence in this regard may result into errors or provision of incorrect or incomplete information, wrong interpretation and unreasonable conclusions that may deviate from established legal norms causing serious consequences. In such situations determining responsibility will also be difficult in adverse circumstances.
6. Some lawyers may be cynical of AI and using it in legal practice due to the potential risks associated with it or their own failure to understand the use of AI which may be considered as a deficiency in legal representation proving a threat to sustainable practice of outdated and technologically less-expensive legal professionals. A revolutionary change over is needed to shift the tendencies of legal professional from manual to

technology aided for which, either they need to get reasonably familiar with the use of technology through special trainings and courses or to hire technology experts. This gap may also be filled by including courses in the curriculum of law so that the fresh graduate must be well equipped with the advanced knowledge and could be fit in the system through adaptability and adoption in a sustainable way.

7. Introduction of AI to legal system is also a potential threat to the employment as the outsourcing of laborious legal work to AI assistants will eventually result into job displacement in this sector as well like all other professions. But we must know that this displacement can never be the full human replacement and can effectively work in the Human-AI collaboration format. Therefore, the experts and relevant persons must be employed in Tech-driven legal system to have transparent, accurate, and expected outcomes.

Conclusion

After exploring different area of legal system where AI-powered tools and application can be employed to achieve the desired objectives of efficacy, accuracy, promptness and feasibility along with many other benefits, it can be concluded that this invention can bring revolution in the field of law if applied with due standards of care and caution. AI is not a silver bullet that can solve all legal problems, nor is it the precursor that will end the legal profession as we know it. However, when utilized responsibly and ethically, AI is a tool that has the potential to enhance the agency of legal practitioners and facilitate improved access to justice. The coexistence of AI and the law can produce a legal system that is more equitable, effective and accessible.

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