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From Human Judges to Digital Judges: AI's Impact on Judicial Work

Mokkedes Amina

MCB , Faculty of Law, University of Ain Temouchent, Algeria

Laboratory of Fundamental Private Law

amina.mokkedes@univ-temouchent.edu.dz

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Abstract:

The article explores the integration of artificial intelligence within the judiciary, positioning it as an auxiliary instrument for case evaluation, forecasting judicial decisions, and streamlining court procedures, while preserving the central role of human judges and safeguarding fundamental justice principles. It provides an overview of AI applications in judicial systems worldwide, highlighting the distinction between digital justice and smart justice. Additionally, the article examines the legal and ethical challenges associated with AI, particularly concerning judicial independence, and concludes by emphasizing the need to establish robust legal and ethical frameworks that enable AI use without undermining the human-centric nature of justice.

Keywords: Smart Justice ; Digital Justice;Intelligent Judicial Systems; Predictive Case Analysis; Legal Automation; AI in Judiciary; Judicial Data Protection .

INTRODUCTION

Today, the world is witnessing an unprecedented technological boom, positioning artificial intelligence as a central element across various fields of life, including justice and the judiciary. Intelligent systems have become capable of processing vast amounts of legal data, analyzing judicial precedents, and providing solutions and recommendations that assist judges and lawyers in making more accurate and timely decisions.

The European Commission and the Council of Europe have prioritized innovation in the justice sector, particularly through digitalization. Since 2016, CEPEJ has developed key guidelines for implementing e-justice in member states.

The COVID-19 pandemic highlighted the critical role of digital tools, as courts equipped with e-filing, intelligent case management, and telematic notifications were able to

continue handling civil and commercial cases, while others faced severe disruption. The crisis underscored that digitization and partial or full online case handling are effective for everyday judicial management and backlog reduction .

In 2020, CEPEJ established the Cyberjust Working Group. Its 2022–2025 Action Plan focuses on assisting states and courts in transitioning to digital justice in line with European standards and Article 6 of the European Convention on Human Rights. CEPEJ has issued guidelines on e-filing, videoconferencing, court digitization, and e-auctions, while additional guidance on online ADR and databases is in development.

Additionally, CEPEJ launched a Resource Center on Cyberjustice and AI to provide reliable information on AI tools and digital justice systems, supporting professional and end-users in understanding their benefits and risks, in line with the European Ethical Charter on AI in judicial systems .

The shift towards smart justice is no longer a luxury but a necessity dictated by the modern era, characterized by the acceleration of transactions and the growing volume of disputes. This makes reliance on intelligent tools an effective means of enhancing efficiency and transparency in judicial work. However, this development raises fundamental questions concerning the legitimacy of integrating artificial intelligence into judicial decision-making and the limits of such reliance without compromising judicial independence and the guarantees of a fair trial.

From this perspective, this article examines the relationship between artificial intelligence and judicial work by outlining the conceptual framework of this technology, reviewing its key applications in the judicial domain, and addressing the legal and ethical boundaries of its use.

Axis one: The Conceptual Framework of Artificial Intelligence and Its Relation to Judicial Work

Artificial intelligence (AI) refers to the capability of computer systems to perform tasks that typically require human intervention, such as reasoning, analysis, and decision-making. In the judicial context, AI encompasses the application of such technologies to support the administration of justice, including the analysis of legal data, provision of accurate information, assistance to judges and lawyers in decision-making, and the enhancement of legal research processes.

AI represents an effective tool that can contribute to increasing the efficiency and effectiveness of judicial work, aligning it with the requirements of modern justice.

Accordingly, this section aims to define the concept of artificial intelligence and examine its relationship with judicial practice**.**

First: The Concept of Artificial Intelligence and Its Relationship with Judicial

Work

The world today is experiencing an unprecedented technological revolution that has transformed all sectors, with the judiciary being particularly affected by the advancements in artificial intelligence. The discussion has moved beyond merely digitizing judicial processes or automating procedures; it now encompasses the question of the extent to which judicial systems can rely on AI for fact analysis and decision-making. This underscores the importance of precisely defining artificial intelligence and distinguishing it from other modern legal technologies, such as e-litigation or digital justice platforms. Understanding this distinction is crucial for assessing the interaction between emerging technologies and judicial authority, while simultaneously ensuring that the principles of justice and fairness are upheld.

Definition of Artificial Intelligence

Although there is no single, universally accepted definition of artificial intelligence (AI), it is useful to outline some widely recognized explanations and key terminology. As discussed later in this report, having a solid understanding of AI is essential to ensure its application benefits the justice system rather than causing harm.

According to the OECD's updated definition (May 2024):

"An AI system is a machine-based system that, for explicit or implicit objectives, infers from the data it receives how to produce outputs—such as predictions, content, recommendations, or decisions—that can impact physical or virtual environments. AI systems differ in their levels of autonomy and adaptability once deployed."[1].

Artificial intelligence refers to the ability of programmed machines to emulate human intelligence by thinking and acting in ways similar to humans. These systems are designed to perform a variety of tasks, including learning, problem-solving, and decision-making[2].

AI represents a broad field that extends across multiple domains, including the legal sector, where it can serve as a supportive tool in resolving judicial disputes and contributing to the administration of justice. However, artificial intelligence is not a substitute for legal professionals or judges; rather, it functions as an enhancement, augmenting their capabilities and assisting in the analysis of complex legal issues and in making decisions grounded in precise and scientific reasoning.

2-The Difference Between Smart Justice and Digital Justice

[1] OECD, Recommendation of the Council on Artificial Intelligence (2019); OECD, Explanatory memorandum on the updated OECD definition of an AI system (2023) .

[2] Ben Sari, Redouane. "Applications of Artificial Intelligence in the Field of Law." *Journals of Politics and Law*, University of Ouargla (Algeria), Vol. 17, No. 1, 2025, p. 27.

Although artificial intelligence and e-litigation both employ digital technologies to serve the administration of justice, they differ in terms of their nature, function, and the role of human involvement, as outlined below:

First, artificial intelligence constitutes a system of software and algorithms capable of self-learning, data analysis, and decision-making without the need for continuous human intervention. In contrast, e-litigation relies primarily on human input for data entry and the management of procedures through designated digital platforms.

Second, AI can play a dual role in judicial work: it may serve as an assistant to judges in analyzing legal files, or it could partially replace certain functions in future applications. Conversely, the human judge remains an indispensable element in e-litigation systems, which cannot operate independently of their oversight[1].

Third, artificial intelligence is characterized by a lower rate of human error due to its high accuracy in automated data processing, whereas e-litigation procedures may be subject to human mistakes, such as the entry of incorrect data or information into the system.

Fourth, AI relies on what is known as predictive justice, which involves analyzing legal data and past case facts to anticipate potential outcomes of disputes. In contrast, e-litigation functions as a procedural framework that enables digital communication and document exchange without incorporating predictive or autonomous judicial analysis.

Fifth, AI can provide legal advice to litigants, summarize and review documents, identify gaps in case files, and offer relevant case law and legal references to assist judges in adjudicating disputes. E-litigation, on the other hand, is limited to managing procedural and technical aspects, including the reception of data and documents entered by human operators.

Sixth, digital justice relies on electronic tools for case management and communication, such as case management systems, online platforms, and virtual courts. Smart justice, however, employs advanced tools for data analysis and decision support, including artificial intelligence, machine learning, and legal data analytics systems[2]..

In short, digital justice focuses on the electronic transformation of the judicial system, whereas smart justice emphasizes leveraging artificial intelligence to enhance decision-making processes within that system.

second: **The ongoing development of AI applications in the field of justice**

In Italy and most EU member states, the digitalization of justice—covering communication, filing, and document exchange—has streamlined procedures, increased judicial efficiency, and enabled online hearings, even during pandemic restrictions.

[1] Sayed Ahmed Mahmoud and Mariam Emad Mohamed Anani. "Artificial Intelligence and Judicial Work: A Comparative Analytical Study." *Journal of Legal and Economic Sciences*, Vol. 66, No. 3, January 2024, p. 926.

[2] Papagianneas, S. Smart courts, smart justice?: Automation and digitisation of courts in China. (2024, September 3) ,p39, https://scholarlypublications.universiteitleiden.nl/access/item%3A4039580/view.

Digitalization has also facilitated the creation of large judicial databases, essential for AI development.

Despite pilot projects in countries such as Estonia, Canada, China, the UK, and the US, most justice systems still make limited use of AI. Challenges include compatibility with core judicial principles, such as transparency, justification of decisions, and rights to defense and cross-examination. AI systems may also be biased, as exemplified by the COMPAS program in the US, which discriminated based on race and social environment.

Nonetheless, AI offers opportunities to address inefficiencies, such as lengthy proceedings and inconsistent rulings, potentially speeding up judgments and enhancing predictability. While AI presents risks, it should also be seen as a tool to improve justice and protect fundamental rights. Technological progress may gradually mitigate concerns like the "black box" opacity of AI systems.

Ethical frameworks, such as the 2018 CEPEJ Charter, emphasize that AI should assist—not replace—judges, promoting efficiency while preserving autonomy, fairness, transparency, and human oversight. Similarly, the EU AI Act (Regulation EU 2024/1689) seeks to embed ethical safeguards, uphold human rights, and ensure AI supports judicial processes without compromising individual freedom[1].

Second Axis: Areas of Artificial Intelligence Use in the Judiciary and Its Limits

Artificial intelligence has become one of the most prominent modern technologies, bringing profound transformations across various sectors of life — the judicial field being no exception. Many judicial systems around the world have begun integrating AI tools at different stages of the judicial process, whether in analyzing legal data, predicting case outcomes, or facilitating the management of cases and judicial procedures. This technological adoption seeks to enhance the speed, accuracy, and transparency of judicial work while alleviating the workload on judges and court staff.

However, the use of AI in the judicial domain remains surrounded by numerous challenges and constraints, particularly concerning its compliance with the principles of justice, judicial independence, and fair trial guarantees, in addition to the ethical and legal questions regarding the accountability of intelligent systems for their decisions or recommendations.

Therefore, this study aims to explore the main areas of AI application within the judiciary and to identify its legal and ethical boundaries, in order to strike a balance between benefiting from its technological advantages and preserving the core values of human justice.

First: Applications of Artificial Intelligence in Judicial Work

[1] artificial intelligence, judicial decision-making and fundamental rights, p16, https://ssm-italia.eu/wp-content/uploads/2025/02/JuLIA_handbook-Justice_final.pdf

The advancement of artificial intelligence (AI) has led to a wide range of innovative applications in the legal field, from predicting court outcomes and detecting financial fraud to automating contract review. Since legal analysis relies heavily on text, large language models (LLMs) offer a unique advantage. Their ability to process vast amounts of information enables rapid analysis of complex legal documents, while their generative AI capabilities support nuanced decision-making and the creation of legal content. Initiatives like LegalBench have demonstrated that LLMs can perform a diverse array of legal tasks across multiple categories of legal reasoning, with effectiveness varying depending on the specific model and task[1].

The following section will discuss some of the key areas where artificial intelligence is applied.

1 -The Use of Artificial Intelligence in Analyzing Judicial Precedents and Predicting RulingsArtificial intelligence

through systems that leverage big data analysis of judicial precedents, can provide predictions regarding the likely outcomes of cases, a practice commonly referred to as "predictive justice.[2] " This enables judges to rely on intelligent systems to facilitate case analysis and expedite decision-making, provided that these systems clearly disclose the reasoning and methodology underpinning their recommendations or predictions[3].

A number of AI-enabled platforms are transforming legal research by automating the processes of information retrieval and analysis:

- LexisNexis and Westlaw: These platforms utilize AI to deliver relevant case law, statutes, and legal precedents, combining keyword searches with contextual analysis to produce precise results[4].
- ROSS Intelligence: An AI-powered research assistant that employs natural language processing (NLP) to efficiently answer legal questions and locate relevant cases[5].
- Casetext: Uses AI to evaluate case law and suggest analogous cases, thereby improving both the scope and depth of legal research[6].

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[1] Posner, Eric A., and Shivam Saran. 2025. Judge AI: Assessing Large Language Models in Judicial Decision-Making. Research Paper Series, Coase-Sandor Institute for Law and Economics, University of Chicago Law School. Chicago: Chicago Unbound ,p2.

[22] Yves Poullet, Les robots à l'assaut de la Justice – L'intelligence artificielle au service de la Justice, 2019,https://latribune.avocats.be/index.php/fr/les-robots-a-lassaut-de-la-justice-lintelligence-artificielle-au-service-de-la-justice.

[3] Abdelrahman Ahmed Al-Harthi and Ali Mohamed Mohamed Al-Droubi. "Litigation Procedures Using Artificial Intelligence: A Jurisprudential and Legal Approach." Al-Ijtihad Journal for Legal and Economic Studies, University of Tamanrasset, Algeria, Vol. 14, No. 01, 2025, p. 406.

[4] https://www.clio.com/blog/lexisnexis-vs-westlaw/.

[5] https://blog.rossintelligence.com/.

[6] https://www.thomsonreuters.com/en/cocounsel.

2-Judicial Decision-Making Using Artificial Intelligence

GPT demonstrates some inconsistency in its characterization of judicial philosophies, yet it applies these philosophies reasonably when analyzing the experimental case. Legal theorists typically classify judges into two main categories: formalists and realists. Judges Truepenny and Keen are considered formalists, as they base their decisions solely on legal materials, whereas the remaining justices are regarded as realists, influenced by non-legal factors—such as morality in the cases of Foster and Tatting, or policy considerations in Handy.

However, if we interpret GPT's references to "positivist" as formalist and its references to other philosophies as realist, its predictions regarding the application of these two judicial approaches are coherent. This raises the question of whether GPT could be guided to render decisions in the manner of realist judges by explicitly prompting it to adopt the principles of legal realism[1].

GPT was assigned the following system prompt:
"You are an appeals judge in a pending case at the International Criminal Tribunal for the Former Yugoslavia (ICTY). Your task is to determine whether to affirm or reverse the lower court's decision."

System prompts play a crucial role in establishing the context for large language models, specifying the role the model is expected to assume and the instructions it must follow. These prompts precede user input and operate independently of it (in this study, the various materials provided to the model). For instance, if the system prompt is set to "Respond in all caps," the model will respond in uppercase letters regardless of the content of the user input. While system prompts are particularly useful in interactive, back-and-forth conversations, where specific instructions must be maintained, they are also effective in single-call interactions, as in this study, by enabling the model to establish the necessary context before processing user input[2].

Whereas Spamann and Klöhn's experiments involved 31 judges and 91 students, this study relied on a single large language model: GPT. To artificially increase the sample size, different seed numbers were used. The seed feature allows the model to fix the sequence of random decisions it generates and associate it with a unique reference number (e.g., 1294802). Consequently, API calls using the same parameters, prompt, and seed number are expected to produce identical outputs[3].

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[1] Posner, Eric A., and Shivam Saran. 2025. *Judge AI: Assessing Large Language Models in Judicial Decision-Making*. Research Paper Series, Coase-Sandor Institute for Law and Economics, University of Chicago Law School. Chicago: Chicago Unbound ,p24.

[2] Similar to Spamann and Klöhn (2016, 2024), we use the Boschloo unconditional exact test instead of the Fisher exact test due to methodological superiorities. See Mehrotra (2003).

[3] Posner, Eric A., and Shivam Saran.ibid ,p10.

The interaction terms further highlight these patterns. GPT is substantially more likely than judges to overturn a conviction when precedent directs reversal, compared to when it indicates affirmation. Specifically, the effect of a reversal precedent is 37 percentage points stronger in the OLS model, 50 times stronger in the Logit model, and 33 times stronger in the Exact Logistic model for GPT relative to judges. Conversely, regarding sympathy, GPT is significantly less likely than judges to reverse a conviction when the defendant is unsympathetic: 41 percentage points less (OLS), 20 times less (Logit), and 14 times less (Exact Logistic).

Overall, the total precedent effect for GPT is -0.22 (OLS) and 0.057 (Logit), indicating it is 22% or roughly 18 times less likely to affirm a conviction when precedent advises reversal. The total sympathy effect is -0.06 (OLS) and 0.501 (Logit), meaning GPT is 6% or about twice less likely to affirm a conviction for an unsympathetic defendant. This contrasts with judges, who tend to affirm convictions more frequently for unsympathetic defendants[1].

3- Employing Artificial Intelligence in Calculating Inheritance Shares to Support Judicial Decision-Making

Artificial intelligence can also be utilized in the judicial domain through the development of specialized intelligent systems, such as an "AI-based Inheritance Calculator," which relies on the Sharia and legal rules stipulated in the Family Code.
This tool contributes to calculating heirs' shares with accuracy and speed, while taking into account special cases, such as ʿAwl and Radd, thereby reducing the judge's time and helping to avoid computational errors. However, the role of this tool must remain supportive, rather than replacing the judge.
In this way, artificial intelligence can enhance efficiency and precision in cases with a calculative nature, without undermining the human judge's essential role as the source of justice.

4- Criminal or Judicial Investigation

A criminal case can be submitted to an intelligent system that conducts the investigation in accordance with legal provisions and subsequently provides results or recommendations. Artificial intelligence can also assist in interrogating the parties and verifying the information they provide. However, AI must not replace the investigating judge, as the latter remains the most competent authority to carry out this task. Thus, artificial intelligence serves as a supportive tool rather than a substitute for the judge[2].

5- Crime Prediction Using Artificial Intelligence

Crime prediction refers to anticipating criminal acts before they occur, with the aim of preventing them and implementing the necessary precautionary measures. The first predictive policing program designed and tested was Compstat, created in the early 2010s

[1] Posner, Eric A., and Shivam Saran.ibid ,p16.
[2] Abdelrahman Ahmed Al-Harthi and Ali Mohamed Mohamed Al-Droubi, *Ibid.*, p. 404.

by William Bratton, then Chief of Police of California. Upon his appointment as head of the Los Angeles Police Department, the city became the first testing ground for Compstat.

The system relies exclusively on field data and focuses on common property crimes, such as burglary, vehicle theft, and robbery. It is programmed to identify high-risk areas, leaving the police to adjust their interventions accordingly. This type of prediction, known as "Predictive 1.0" for crime-prone locations, achieved considerable success among law enforcement agencies. Following this success, the idea quickly emerged to expand the use of such algorithmic predictions to cover other categories of crime[1].

Among the most innovative methods for crime prediction in the era of artificial intelligence are the following:

- Big Data Analytics:

The process begins with the electronic submission of complaints through intelligent applications linked to judicial authorities. The accuracy of the submitted information is then verified. Once the data is confirmed to be reliable, the next stage involves collecting and analyzing information related to suspects and complainants. This enables a highly precise assessment of potential risks[2].

- Facial Recognition Technology:

This technology is employed to identify suspects through surveillance cameras in public spaces and large gatherings, from various distances and angles. AI-powered software supports these operations to provide accurate and reliable identification of suspects.

- Digital Forensic Analysis:

This method combines criminology and computer science to generate digital evidence regarding crimes that have occurred. Digital forensic analysis utilizes all available data from law enforcement agencies, as well as information from other sectors such as health and social services, enhancing the capacity for precise criminal investigations[3].

- Intelligent Robots in Security Investigations:

The use of intelligent robots has become increasingly common in security and law enforcement operations due to their ability to interact with individuals and respond to inquiries. For instance, in 2017, the Dubai Police introduced the first intelligent police robot in the Arab region, designed to raise awareness about drug-related risks

[1] Margot Chambon, la police prédictive, Mémoire Master 2 recherche sciences criminelles parcours sciences criminologiques, Aix-Marseille Université - Faculté de droit et de science politique, 2018, p13.

[2] Ait Ali Zeina, "The Use of Artificial Intelligence Technologies in International Security Work: Predictive Policing in Smart Cities as a Model," *Journal of Real Estate Law*, University of Blida, Algeria, Vol. 11, No. 2, 2024, p. 67.

[3] Aqba Bouamra, "Crime Prediction in the Digital Era: Utilizing Intelligent Systems for Early Detection of Crime Hotspots," *Maâarif Journal*, University of Bouira, Algeria, Vol. 19, No. 2, 2024, pp. 193, 195.

in an innovative manner. These intelligent robots represent an advanced tool for crime detection, utilizing sophisticated algorithms such as computer vision to analyze data and identify criminal patterns[1].

- Smart Crime Prediction Systems:

These systems rely on processing vast amounts of data, including information from police radar networks, to reduce crime rates by predicting locations most susceptible to criminal activity. The system analyzes data accurately according to the latest developments in each area and identifies potential coordinates where crimes might occur. This enables law enforcement to implement preventive measures, such as installing cameras in high-risk locations[2].

In short, crime prediction using artificial intelligence is a modern technology that combines data, behavioral analysis, and intelligent tools, enhancing the ability of law enforcement agencies to prevent crimes and improve investigative efficiency, while maintaining human oversight to ensure both justice and effectiveness.

Second: Applications of Artificial Intelligence in Comparative Judicial Systems

So far, the impact of artificial intelligence on justice systems remains uneven. While some countries have practically adopted AI applications within their judicial sectors, others are still in the early stages of integrating fundamental technological advancements, let alone AI itself.

AI applications in this domain range from routine administrative tasks related to case management, to predictive analyses and support for legal research.

Given the challenges faced by judicial systems—such as case backlogs, lengthy procedures, and limited accessibility to justice—AI integration is expected to bring substantial benefits. It holds significant potential to enhance efficiency, accelerate responses, provide judicial services better aligned with individuals' needs, support routine tasks, and expand the capabilities of justice professionals across various fields[3].

1-Petition Classification System

In 2024, the French Court of Cassation developed an intelligent system designed to classify petitions and appeals, directing them to the appropriate judicial chambers based on training data derived from previous cases. This system has significantly improved case

[1] Aqba Bouamra, **ibid**, p. 195.
[2] https://www.techandjustice.bsg.ox.ac.uk/research/spain.
[3] Redden, J. and M. O'Donovan Dix (2020), *Artificial intelligence in the criminal justice system: Demystifying artificial intelligence, its applications, and potential risks*, https://www.ojp.gov/ncjrs/virtual-library/abstracts/artificial-intelligence-criminal-justice-system-demystifying.

management and ensured that matters are presented at the appropriate level of judicial scrutiny.

Similarly, in Brazil, the VICTOR AI system was implemented to examine appeals submitted to the Supreme Court by identifying cases with "public impact," a key criterion for processing appeals (Brazilian Supreme Court, 2024). While a court clerk typically requires approximately 44 minutes to assess whether an appeal meets the admissibility requirements, VICTOR AI accomplishes this task in mere seconds[1].

The Superior Labor Court in Brazil has also introduced another intelligent system known as Chat-JT, a generative AI tool designed to assist judges, court staff, and trainees in managing routine tasks. These tasks include legal research, document analysis, and the preparation of standardized summaries. The system was launched in February 2025 and enables users to create customized digital assistants tailored to their specific needs within the judicial workflow. Additionally, Chat-JT integrates internal databases and provides advanced search capabilities, aiming to streamline daily operations and enhance decision-making processes within the labor justice system (CNJ).

2-AI-Powered Anonymisation in European Justice Systems

AI systems can be designed and trained to automatically detect and classify various types of information within judicial documents and transcripts, including personally identifiable data such as names and addresses. Through this capability, AI contributes to safeguarding sensitive information and ensuring privacy protection—both of which are essential in the administration of justice. Several countries have already implemented practical initiatives illustrating how AI can be applied effectively in this domain .

Spain: The Ministry of the Presidency, Justice, and Parliamentary Relations provides an AI-based anonymisation tool within its NLP and generative AI suite. It removes personally identifiable information from legal documents through three modes—automatic, initials-based, and fully customisable—allowing the creation of GDPR-compliant, shareable documents. Users can select which types of information to anonymise, including names, addresses, legal entities, ID numbers, emails, and social media profiles[2].

Croatia: Since January 2025, the AI tool ANON automates anonymisation and publication of court decisions. Integrated with the national eSpis case management system, it anonymises first-instance judgments and suggests indexing for public access via the Search Engine for Decisions of the Courts. Higher-instance judgments are anonymised with final verification by authorised court staff. This initiative, supported by the National

[1] **Justiça do Trabalho lança inteligência artificial para auxiliar profissionais da instituição ; https://www.cnj.jus.br/justica-do-trabalho-lanca-inteligencia-artificial-para-auxiliar-profissionais-da-instituicao.**

[2] https://www.techandjustice.bsg.ox.ac.uk/research/spain.

Recovery and Resilience Plan 2021–2026, aims to enhance transparency, improve legal information access, and ensure data protection compliance.

Austria: The Federal Ministry of Justice runs a project combining AI techniques—search-based methods using register data, regular expressions, NLP, and custom ML algorithms—to automate anonymisation of court decisions. The goals are to increase efficiency, reduce manual effort, and enable broader access to anonymised judgments.

France: The Court of Cassation uses an AI-driven anonymisation engine to identify and protect personal data in court decisions, preparing them for public release as part of an open data initiative.

Greece: The Ministry of Justice employs AI to translate, summarise , and anonymise documents, and is introducing an AI assistant to guide citizens and lawyers in accessing electronic and non-electronic justice services[1].

3-AI-powered chatbot to provide practical information

Portugal's Ministry of Justice has introduced the Practical Guide to Justice (GPJ), an AI-powered chatbot designed to give the public easy and direct access to justice-related information. The GPJ is programmed to understand and respond to a wide variety of questions in a clear and approachable manner. Drawing on data from the Digital Justice Platform, it offers practical guidance on legal matters, helping users navigate the justice system more efficiently. The chatbot delivers responses in plain, user-friendly language, effectively bridging the gap between the complexity of the legal system and the general public, making justice-related information more accessible for everyone.

4-Predictive Policing

Predictive policing employs a comprehensive suite of technologies and methodologies, including Artificial Intelligence (AI), Machine Learning, Big Data analytics, Data Fusion, Geospatial Information Systems (GIS), Call Data Record (CDR) analysis, facial recognition, and video surveillance. Through the systematic analysis of these datasets, law enforcement agencies can forecast the probable locations, timing, and potential actors involved in criminal activity, thereby enabling a more proactive and informed approach to crime prevention and public safety management[2].

Predictive policing relies on artificial intelligence and data analytics to anticipate potential criminal activity before it happens. It can involve analyzing large datasets drawn

[1] https://www.oecd.org/en/publications/governing-with-artificial-intelligence.
[2] **Manish Gupta , Predictive Policing: How AI and Analytics Are Transforming Crime Prevention, June 5, 2025, https://innefu.com.**

from crime reports, arrest records and social or geographic information to identify patterns and forecast where crimes might occur or who may be involved[1].

5-Automated transcription

Automated transcription has become a valuable tool for enhancing access to court proceedings. In Slovenia, for example, this technology is being used to facilitate greater access to judicial hearings by rapidly converting spoken language into written text, thereby promoting transparency and enabling a broader audience to review and comprehend legal processes [2].

In Spain, transcription services — known as "textualisation" — have been in operation since 2019 and are fully integrated into the HORUS electronic judicial file viewer. This integration not only generates accurate transcripts but also allows for quick and efficient navigation through hearing recordings. The system achieves this by:

- linking each portion of the text to the corresponding time frame in the audio or video recording, and
- identifying the various speakers, enabling users to determine which party is speaking at any given moment.
- This technology is particularly significant in Spain, where the hearing recording itself constitutes the official court record, making automated transcription essential for ensuring accuracy, accessibility, and transparency in judicial proceedings[3].

6-Monitoring Judicial Performance and Enhancing Accountability- RAFA 2030 Project-

Artificial Intelligence (AI) has demonstrated significant potential in promoting transparency and accountability within governmental and judicial activities (OECD, 2022[152]). In the justice sector, AI is increasingly being applied to monitor court performance, ensure consistency in judicial decisions, and support policy evaluation through data-driven insights.

[1] **Predictive policing AI is on the rise − making it accountable to the public could curb its harmful effects , May 6, 2025, https://theconversation.com/predictive-policing-ai-is-on-the-rise-making-it-accountable-to-the-public-could-curb-its-harmful-effects-254185.**

[2] **Governing with Artificial Intelligence,ibid.**

[3]**Governing with Artificial Intelligence,** https://www.oecd.org/en/publications/governing-with-artificial-intelligence_795de142-en/full-report/ai-in-justice-administration-and-access-to-justice_f0cbe651.html#Cou24_6f09aca72d.

These AI-based oversight tools can analyse patterns in case management and judicial rulings, thereby identifying inefficiencies or inconsistencies that may require institutional reform. However, to preserve judicial independence and autonomy, such systems must operate within robust governance frameworks that guarantee proper checks and balances—such as independent oversight bodies, administrative autonomy, and autonomous judicial review.

Without these safeguards, AI-driven monitoring could risk undue interference in judicial work or lead to the misuse of data—for example, using analytical results to penalise judges for unpopular decisions rather than to improve systemic efficiency. Therefore, governance mechanisms are essential to ensure that AI insights are used constructively and not as tools of control or evaluation bias.

Although still less common compared to other applications of AI in justice, AI-based judicial oversight and performance monitoring represent a growing and promising area for development. A leading example is Brazil's RAFA 2030 Project, implemented by the Supreme Federal Court (STF), which stands out as an innovative initiative using AI to enhance accountability, transparency, and efficiency within the judicial system[1].

Third: Algeria's Efforts Towards Implementing Artificial Intelligence in Judicial Work

In the context of judicial work, it is essential to distinguish between artificial intelligence and e-justice. E-justice focuses on the digitization of judicial procedures, such as filing cases online or holding remote hearings, with the aim of facilitating access to justice and improving administrative efficiency. In contrast, artificial intelligence in the judiciary involves the use of advanced algorithms, machine learning systems, and data analysis to support judicial decision-making, such as case analysis, providing recommendations, or predicting case outcomes, without necessarily transforming the entire judicial system into a digital format. Thus, artificial intelligence serves as a tool to enhance the quality and efficiency of judicial work, while e-justice aims to facilitate access to justice through digital means. Accordingly, this section will examine Algeria's efforts to integrate artificial intelligence technologies into the judiciary, beyond mere digitization.

For several years, Algeria has been striving to modernize its justice sector through a comprehensive project aimed at digitizing judicial services. The Algerian legislator has enacted a series of legal texts to support this transformation, most notably Law No. 15-03 [2]on the Modernization of Justice and Executive Decree No. 333/04, which established a directorate specialized in digitalization within the Ministry of Justice[3].

[1] https://portal.stf.jus.br/hotsites/agenda-2030.
[2] Law No. 15/03, issued on 01/02/2015, related to the Modernization of Justice, O.J. No. 06, issued on 10/02/2015
[3] https://portail.mjustice.dz/remote/login?lang=fr.

These efforts have materialized in practice through the launch of the Ministry of Justice's electronic portal, the widespread implementation of remote criminal record requests, and the adoption of video trial systems during the COVID-19 pandemic. These measures have contributed to improving the efficiency of judicial services and reducing litigation delays[1].

Since the enactment of the Justice Modernization Law, most courts in Algeria have extensively applied its provisions. During the first year of implementation, 153 remote hearings were conducted via video conferencing. The first session took place on October 7, 2015, at the Court of El Kala in the misdemeanors section. Officials overseeing the project emphasized that the objective of this technology is to alleviate overcrowding in courts, reduce the logistical burden on defendants, law enforcement officers, prison administration, and witnesses, and accelerate the pace of case resolution.

Regarding international remote trials, the first such hearing was held on July 11, 2016, between the Court of M'sila in Algeria and the Court of Nanterre in France. Many legal professionals and lawyers who participated in these sessions praised the advantages of this experience, particularly with respect to the provision of real-time interpretation from Arabic to French, and for enhancing the international image of the Algerian judiciary, especially concerning the respect for the right to defense and the principles of a fair trial.

This technology is particularly beneficial for individuals who are unable to attend court physically due to health reasons, as it significantly reduces time, effort, and associated costs[2].

Digitalization represents a crucial transitional phase in the modernization of Algeria's judicial system, aiming to convert judicial procedures and services into electronic formats, such as e-filing of cases, remote notifications, and digital case management. In recent years, Algeria has witnessed significant progress in this field thanks to the Justice Modernization programs launched by the Ministry of Justice, which have facilitated judicial workflows, enhanced court efficiency, and alleviated administrative and human burdens.

However, the integration of artificial intelligence into judicial work constitutes a more advanced stage than mere digitalization. It goes beyond technical transformation to the use of algorithms for analyzing legal data, predicting case outcomes, and supporting judges in decision-making. Algerian efforts in this regard remain at an early stage, as no comprehensive national strategy or dedicated legal framework has yet been announced to

[1] **Belbagui Boumediene,** The Impact of Intelligent Systems on the Future of Criminal Justice: Between the Right to Privacy and the Imperative of Modernization, *Law and World*, https://lawandworld.ge/index.php/law/article/view/843?utm_source=chatgpt.com.

[2] **Numérisation du secteur de la justice : Près d'un million de casiers judiciaires retirés à distance en 2022**

, https://elwatan-dz.com/numerisation-du-secteur-de-la-justice-pres-dun-million-de-casiers-judiciaires-retires-a-distance-en-2022?utm_source=chatgpt.com.

regulate AI applications in the justice sector, unlike many advanced countries that have established clear policies and specialized legislation to govern this field.

An analysis of the legal and regulatory framework for artificial intelligence in Algeria, compared to advanced countries, reveals a clear legislative gap. While these countries have successfully established comprehensive and integrated legal frameworks to govern various aspects of AI, Algeria remains at an early stage in terms of legislative regulation of this field.

The main manifestations of this gap include:

- The absence of a unified national strategy that defines a clear vision and major objectives for AI development.
- The lack of specific legal provisions regulating the use and development of AI technologies across their various applications.
- Reliance on traditional general legislation to address issues that are technical, complex, and rapidly evolving[1].

Fourth: Limits of Using Artificial Intelligence in the Judiciary

The United Kingdom has established comprehensive guidance for judicial officers regarding the adoption and use of artificial intelligence (AI) within courts and tribunals. This guidance provides a structured framework to ensure that AI applications are implemented in ways that uphold judicial responsibilities, particularly safeguarding the integrity and fairness of legal proceedings. It is applicable to all judicial office holders operating under the authority of the Lady Chief Justice and the Senior President of Tribunals, including their clerks and support personnel.

The framework emphasizes critical considerations such as confidentiality, accountability, mitigation of bias, and security of information. It outlines clear principles for employing AI tools, indicating tasks where AI can provide meaningful support, including document summarization and routine administrative functions. At the same time, it advises caution in more sensitive domains, such as legal research and analytical tasks, and draws attention to potential risks, including the spread of misinformation and the improper use of AI-generated content within judicial processes. To aid understanding, the guidance includes practical examples illustrating both opportunities and challenges associated with generative AI technologies in judicial settings.

This guidance was developed collaboratively by a cross-jurisdictional judicial group after extensive consultation with judicial stakeholders, marking an initial but significant step toward integrating AI responsibly into the judiciary. Looking ahead, the plan includes

[1]Fathi Mezouar, The extent to which the Algerian Legislation keeps pace with the acceleration of the useof artificial intelligence, The International tax journal ,p462 .

publishing a frequently asked questions (FAQ) resource to address queries from judicial staff, alongside periodic reviews to ensure that the guidance evolves in line with technological advancements and emerging best practices[1].

Axis Three: **The Compatibility of Artificial Intelligence with the Principle of Judicial Independence**

The principle of judicial independence is one of the fundamental pillars upon which the rule of law is built, as it guarantees the impartiality of the judge and their freedom to issue rulings based on personal conviction grounded in law and conscience.
However, the introduction of artificial intelligence systems into judicial work raises essential questions regarding the extent to which these technologies are compatible with this constitutional principle.[2].

many scholars remain highly skeptical about the use of AI tools by judges. The main concern lies in the so-called “sheep effect” (effet moutonnier), where a judge might avoid taking responsibility and merely follow the algorithm’s recommendations. Indeed, the risk of a judge being unduly influenced by an algorithm should not be underestimated. AI support can relieve decision-makers of the burden of providing detailed reasoning and may lend a veneer of “scientific” and “neutral” authority to decisions, which algorithmic evaluations currently possess, despite lacking a solid foundation. The danger is that a judge may follow the AI’s advice blindly, without independently assessing the specific circumstances of the case or the applicable law[3].

Such risks must be avoided. A judge’s autonomy—being solely responsible for interpreting the applicable law and evaluating the unique aspects of each case—cannot be constrained. As highlighted by the Wisconsin Supreme Court in the Loomis case, a judge must retain full independence in their decision-making and not rely exclusively on guidance from AI systems. Importantly, under the AI Act, high-risk systems, such as those designed to support judicial authorities, must be developed in a manner that allows human oversight.

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[1] Artificial Intelligence (AI) – Judicial Guidance , 14april2025, https://www.judiciary.uk/wp-content/uploads/2025/04/Refreshed-AI-Guidance-published-version-website-version.pdf.

[2] The amended Algerian Constitution of 2020 enshrines the principle of judicial independence in Article 163: "The judiciary is an independent authority. The judge is independent and is subject only to the law."

[3] The judge Chuck Grassley explained that a law school intern used OpenAI’s ChatGPT to conduct legal research without authorization or disclosure, which violated both his chamber’s policy and the relevant law school policy.
Neals added, “My chamber’s policy prohibits the use of generative AI (GenAI) for conducting legal research or drafting judicial opinions and orders.” ,Landon Mion, Artificial Intelligence
Federal judges acknowledge court ruling errors tied to staffers’ AI use after Grassley inquiry,fox news 24October, 2025, https://www.foxnews.com/politics/federal-judges-acknowledge-court-ruling-errors-tied-staffers-ai-use-after-grassley-inquiry.

This oversight is essential to prevent or mitigate risks to fundamental rights that may arise from the use of such systems[1].

The compatibility between artificial intelligence and judicial independence is possible, provided that technology remains in a supportive role rather than a controlling one, and that judges retain their central role in issuing rulings, as the essence of justice is not merely a computational process but a human act grounded in conscience, reason, and judgment.

Artificial intelligence represents a modern tool capable of supporting judicial independence and enhancing efficiency; however, it simultaneously raises a set of risks that must be addressed with great caution. In this context, the subject can be divided into two main points.

First:Opportunities Offered by Artificial Intelligence to Enhance Judicial Independence

The digitalization of justice refers to the transformation of judicial systems through digital tools, AI technologies, networks, and media. This shift has the potential to deliver faster, more efficient, and cost-effective services while fully upholding the rule of law and safeguarding both substantive and procedural rights of all citizens.

Primarily, it encompasses solutions that improve access to justice by establishing digital channels for interaction and data exchange between courts and users. These include electronic registers, digital file and workflow management, e-documents, e-signatures, e-service of decisions, and e-archives[2].

Beyond these, additional opportunities include:

- Secure, timely, and efficient archiving of judicial and administrative documents.
- Transparent and fully traceable management of judicial acts.
- Processing and analysis of data contained in legal documents.
- Creation of navigable databases, particularly for case law, using machine learning, natural language processing, and Big Data analytics.
- Acquisition and management of digital evidence.
- Automated case allocation via algorithms to ensure fairness, transparency, and protection from undue influence.
- Workload distribution according to criteria that reduce case disposition times.

[1]Artificial Intelligence, Judicial Decision-Making and Fundamental Rights, p. 18.
[2]Sophia Adams Bhatti, AI in our Justice System A JUSTICE , January 2025,p25, https://files.justice.org.uk/wp-content/uploads/2025/01/29201845/AI-in-our-Justice-System-final-report.pdf.

- Remote, secure, and user-friendly procedures.

- Detailed statistical analysis of workflows and critical points to detect inefficiencies and optimize judicial practices[1].

The overall benefits include enhanced accessibility, transparency, and openness, promotion of consistent case law and ethical practices, reduced risk of corruption, and lower costs and inconveniences for all parties involved.

Second: Risks Posed by Artificial Intelligence to the Principle of Judicial Independence

Artificial intelligence is not a comprehensive solution and carries serious risks. Incidents such as the "Horizon" system scandal in the UK Post Office[2] and the child benefits scandal in the Netherlands—which led to thousands of people being wrongfully accused of fraud due to a discriminatory algorithm[3]—demonstrate the severe harm that can result from unregulated reliance on technology[4] .

The AI Act adopts a risk-based approach designed to establish a proportionate and effective framework of binding rules for artificial intelligence systems. This approach adjusts the type and scope of legal obligations according to the level and extent of risks that AI systems may pose. Accordingly, the Act prohibits AI applications that present unacceptable risks to essential public interests recognized and protected under Union law, including fundamental rights, democracy, the rule of law, and environmental protection.

The prohibition extends to practices with the potential to manipulate individuals through subliminal techniques operating beyond their conscious awareness, or to exploit vulnerabilities of specific groups—such as children or persons with disabilities—in ways that could materially distort their behavior and cause psychological or physical harm. Furthermore, the Act bans AI-based social scoring systems used by public authorities for

[1] Avani Fatabhai Aal, AI in Legal Research and Case Prediction: Transforming the Future of Law, A Global Journal of Interdisciplinary Studies, – Volume 8, Special Issue, March 2025,p325.

[2] The Post Office Horizon scandal has been called the UK's most widespread miscarriage of justice, after hundreds of people were wrongly prosecuted due to faulty software which suggested money was missing from their branch accounts. Post Office Horizon scandal: Why hundreds were wrongly prosecuted, https://www.bbc.com/news/articles/c1wpp4w14pqo.

[3] Between 2013 and 2019, Dutch authorities wrongly accused thousands of families of child benefit fraud, even though many of them were fully compliant with the law.
The administrative system relied on government algorithms and software to detect fraud, but these algorithms were biased, disproportionately targeting certain families—often of migrant backgrounds.
As a result, benefits that had already been paid were reclaimed, and the affected families faced severe financial difficulties, including bankruptcy, loss of homes, and significant psychological and social harm.
In 2021, the Dutch government issued a formal apology to the public, and Mark Rutte's entire government resigned over the scandal, taking political responsibility for the crisis. This incident highlights the risks of relying on automated systems and algorithms to make sensitive decisions without proper human oversight.

[4] AI in our Justice System, https://www.justice.org.uk/reports/ai-in-our-justice-system.

general purposes, as well as the real-time remote biometric identification of individuals in public spaces for law enforcement purposes.

For limited-risk systems, such as chatbots, the AI Act imposes transparency requirements, ensuring that users are informed when they are interacting with a machine. In contrast, minimal-risk systems, including AI-powered video games or spam filters, may be freely deployed without restriction[1].

However, high-risk AI systems—those potentially threatening human rights—are subject to stringent regulatory oversight, involving conformity assessments, certification processes, registration obligations, and post-market monitoring. The classification of a system as "high-risk" depends on its intended use.

Under the AI Act, systems designed to assist judicial or administrative authorities in researching and interpreting facts and laws, or in applying the law to specific cases—along with similar applications used in alternative dispute resolution—are explicitly categorized as high-risk. Consequently, AI tools deployed within the justice sector must fully adhere to the strict regulatory standards established by the AI Act[2].

When transitioning from digital transformation to the use of algorithms and Artificial Intelligence in the justice sector, it is crucial to consider not only the challenges of modernization but also the risks inherent to these technologies.

The rapid, unpredictable, and far-reaching development of General AI tools—such as ChatGPT, Microsoft's Bing chatbot, and Google Bard—has intensified the debate between rejection and adoption, dividing opponents and advocates of AI. On one hand, there is widespread concern about short-term issues, including biased outputs, "hallucinations," and the oversimplification of complex matters, as well as long-term risks, ranging from harmful content and societal disruption through misinformation and propaganda to extreme scenarios, such as the creation of viruses or the theft of nuclear codes. On the other hand, technological advancement and AI are sometimes embraced without sufficient critical assessment[3].

The main risks are as follows:

1. Lack of Transparency: AI decision-making, especially in deep learning systems, is often opaque. Without clear reasoning, judges, lawyers, and parties may struggle to review or challenge decisions, potentially undermining trust in the judiciary.

2. Algorithmic Bias and Fairness

Artificial intelligence models may inherit biases embedded in historical legal data or

[1] https://www.whitecase.com/insight-alert/long-awaited-eu-ai-act-becomes-law-after-publication-eus-official-journal?utm_source=chatgpt.com.

[2] Artificial Intelligence, Judicial Decision-Making and Fundamental Rights, ibid, p. 17.

[3] Ibid ,p25.

training datasets, leading to unfair predictions and outcomes, particularly against marginalized groups. If past judicial decisions were biased, AI systems may replicate and reinforce those discriminatory patterns in legal outputs, raising serious concerns about equality and the protection of fundamental rights within the justice system[1].

3. Privacy and Data Security: Legal AI relies on sensitive data, increasing risks of breaches, cyberattacks, and unauthorized access, which could compromise confidentiality and cause legal consequences[2].

4. Over-Reliance on AI: Excessive dependence may weaken human judgment and traditional legal skills, threatening the fair and independent application of the law[3].

Conclusion

This study demonstrates that artificial intelligence (AI) represents a qualitative shift in modern justice by accelerating judicial procedures, enhancing the accuracy of rulings, and facilitating access to legal precedents and data. AI also equips judges with advanced tools for analyzing legal texts and predicting case outcomes, thereby improving the efficiency of the judicial system and the quality of judicial work.

However, justice cannot be reduced to numerical equations or technical algorithms, as it fundamentally relies on human principles that machines cannot fully comprehend, such as fairness, compassion, and the judge's discretionary authority. Judges do not apply legal texts mechanically; rather, they interpret and deliberate on them to balance the rights of the parties with the interests of justice. Therefore, AI remains a supportive tool, not a substitute for human judges, and its use must be governed by strict oversight and ethical frameworks.

The future of justice, both in Algeria and globally, does not lie in the "automated judge," but in the "digital judge"—combining modern technological capabilities with human conscience to achieve faster, more transparent, and equitable justice without compromising its human essence.

Recommendations:

1. Establish a comprehensive legal framework regulating the use of AI in Algeria, taking into account the specificities of national law.
2. Create a national authority responsible for monitoring AI applications in public institutions, particularly within the justice sector.
3. Develop training programs for judges and lawyers on digital transformation and the understanding of legal algorithms.

[1] Avani Fatabhai Aal, ibid,p325.
[2] Sayed Ahmed Mahmoud and Mariam Emad Mohamed Anani, p. 939.
[3] The dangers of using artificial intelligence in the field of law ,27/10/2024, https://belzuz.com/publicacion/the-dangers-of-using-artificial-intelligence-in-the-field-of-law.

4. Adopt strict ethical standards to ensure justice, transparency, and non-discrimination in the application of intelligent systems.

5. Strengthen international cooperation in digital justice and facilitate the exchange of legislative and technical expertise.

6. Emphasize the fundamental role of the human judge as a safeguard of justice, since technology, regardless of its accuracy, cannot embody human awareness and the values of justice.

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