



Artificial Intelligence in Judicial Management: Applications, Ethics, Risks and a Polish Perspective

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Abstract

Motivation: The integration of AI into judicial systems is rapidly transforming court administration, case management, and decision support. While these innovations promise efficiency gains and improved access to justice, they also introduce complex ethical, governance, and institutional risk challenges that appear to remain underexplored, particularly in Poland's transitional judiciary.

Aim: This systematic literature review examines global and Polish-focused scholarship to identify gaps in current research and synthesise major themes in AI applications for judicial management. It aims to provide a high-level overview of international developments and regulatory frameworks at the global and EU levels. It explores associated ethical and legal considerations as well as implementation risks. Finally, the review looks into best practices and potential pitfalls of AI deployment in courts.

Results: Three overarching themes emerge. First, AI applications in judicial management encompass automated case triage, predictive analytics for sentencing, and document and workflow automation. Second, ethical and governance considerations focus on such areas as transparency and explainability, algorithmic bias mitigation, and accountability frameworks that preserve human oversight. Third, institutional risks include data privacy vulnerabilities, unclear liability and regulatory gaps, and capacity constraints within court infrastructures.

Across these themes, the Polish context highlights barriers such as limited digital infrastructure, evolving legal frameworks, and the need for specialised training of judicial personnel.

Keywords: AI; judicial management; ethics; risk; Poland

JEL: K40; K41; L86; M15

1. Introduction

Courts worldwide are undergoing a digital overhaul. They use artificial intelligence (AI) to speed up routine tasks, improve case tracking and assist judges in making decisions. At the same time, bodies like the EU and UNESCO have set rules, such as the EU AI Act (Regulation 2024/1689) and UNESCO's guidelines, to ensure AI in the public sector stays ethical. Leading systems in the United States and China already run AI tools in courtrooms, boosting efficiency but also sparking debates about transparency, accountability and fair trials.

Yet we know little about how courts actually manage and govern these AI tools, especially in young or transitional democracies. Regrettably, most scholars only dive into technical advances or large-scale social effects, rather than the managerial, legal and ethical issues of AI in court administration.

How can we bridge that gap? This review concentrates on mapping global AI uses in judicial management and highlights Poland as an example of a transitioning judiciary. It examines ethical principles, governance structures and institutional risks, e.g. data privacy, liability and limited technical capacity, in order to pinpoint research gaps for future study.

The approach combines a critical analysis of scholarly work with an inductive review of legislation and policy documents at national, regional and EU levels. The paper unfolds in four parts: the literature review, the methodology, the results and the conclusions.

2. Literature review

The literature on AI in court management has dynamically expanded over the past decade (striving to keep in step with the development of AI itself), highlighting efficiency gains, greater transparency and complex ethical challenges. Studies show that machine learning and natural language processing (NLP) streamline tasks such as document classification, case scheduling and legal research, thereby reducing backlogs and optimising resources. At the same time, “open justice” initiatives convert court data into easy-to-use formats, supporting evidence-based policies and enhancing public engagement. More recent research explores multimodal AI systems that integrate audio, video and physiological data to assist in hearings, but it remains to be seen

whether these systems respect cultural contexts and guarantee algorithmic accuracy.

The second theme this review focuses on concerns regulatory and governance frameworks. International and national bodies, especially within the EU, have proposed legislation and guidelines (e.g. the AI Act (Regulation 2024/1689) and UNESCO's recommendations (UNESCO, 2021)) that set standards for transparency, accountability and data protection. Yet, it appears that courts still face technical and organisational obstacles to implementing these rules.

The third subsection addresses ethical considerations and risks. Experts warn that using “black-box” AI, which cannot explain its decisions, may undermine judicial independence, fairness in procedures, and the right to a fair trial (de la Osa & Remolina, 2024; Teremetskyi et al., 2025).

Finally, the review turns to Poland as a case study of a transitioning judiciary. How will Poland navigate the challenges of change management and influence its rulings through AI?

2.1. Applications in court management

In the growing body of literature on court administration, three broad yet interconnected areas of AI application consistently stand out: comprehensive smart court platforms, predictive analytics and performance tools, and the expanding field of AI-driven document analysis and multimodal courtroom technologies. The following subsections examine each of these domains more closely, as each offers distinct advantages and poses unique challenges.

2.1.1. Comprehensive smart court systems

A “smart court system” refers to a technology-based court that uses digital tools to digitise, automate and optimise all court operations. Unlike traditional courts reliant on manual processes, smart courts consolidate electronic filing, online hearings, case management, decision support, and enforcement – all powered by AI, big data analytics, blockchain, and advanced automation.

China's Smart Court is the largest digital transformation to date, assembling big data, blockchain, and both advisory and determinative forms of AI under one system (Shi et al., 2021, pp. 8–12). This framework has delivered easier access to justice, faster dispute resolution, and substantial cost savings by enabling processes and judgment enforcement online. However, automating judicial functions raises concerns about judicial independence, algorithmic bias, privacy, and the digital divide (Shi et al., 2021, pp. 12–18).

Some other countries adopt more tailored approaches, e.g. Singapore's Small Claims Tribunal uses in-house generative AI (Harvey AI) to advise citizens, guide them through procedures, and estimate claims. A system that

appears to embody a real-time user-supportive smart court (de la Osa & Remolina, 2024, pp. 9–10). Estonia pilots decision-support tools and data analytics in its e-Justice system, showing it wants to scale up transparent and efficient solutions (de la Osa & Remolina, 2024, pp. 9–10). These examples show that using digital-first court management improves efficiency and public service but must still learn to balance innovation with legitimacy and human supervision.

2.1.2. Predictive analytics and performance management

“Predictive analytics” in the judicial context means using statistical and machine learning techniques to predict case results, help manage courts, and plan how to use resources. Unlike simple data reports, predictive analytics allows courts to forecast patterns and manage workloads ahead of time by analysing large amounts of data.

For example, using a statistical method, Tehran’s General Court of Law was able to correctly predict case outcomes with 95% accuracy, showing that resolving more cases not only reduces backlog, but also improves court efficiency (Farzammehr et al., 2024, pp. 389–390). Similarly, New Zealand created a mixed model, which combines machine learning with legal rules for sentencing assault cases, ensuring that judges can understand the results (Rodger et al., 2023).

Spain’s Judicial Administration 4.0 uses both predictive tools for triaging cases and generative AI for drafting orders, while putting in place regulatory controls to prevent technology from outpacing law (Torres, 2025, pp. 108–110, 125). The Netherlands encodes procedural rules directly to digital systems, which does improve efficiency, but raises concerns about fairness when decisions are automated (Reiling & Contini, 2022, pp. 13–14).

Comparative research (Guitton et al., 2025) shows that national factors such as political attitudes and administrative capacity have a strong impact on how and why courts use predictive analytics. These tools are valuable for planning, however still require constant supervision and careful integration to preserve justice values.

2.1.3. Advanced document processing and information extraction

Document processing systems refer to AI-powered tools that manage, analyse, and interpret judicial documents, therefore enabling faster review, classification, anonymisation, and even translation. This application is especially relevant as courts become overwhelmed with electronically filed cases and digital archives.

The highest performing systems use deep learning and transformer models. For example, in Indonesia, a “Bidirectional Encoder Representations

from Transformers” model (BERT) is deployed. BERT is a machine learning model for NLP, which reads text both ways (left-to-right and right-to-left; unlike earlier models that read text in one direction only). It reached 0.96 accuracy in classifying court decisions (Solihin et al., 2025, p. 1627).

Slovakia uses NLP to automatically anonymise published judgments, achieving strong privacy standards (Kvasnica, 2025, pp. 275–276). Whereas Brazil piloted a text simplification tool, which makes difficult legal texts easier to read for the public (Alves et al., 2023, pp. 281–282).

In order to reduce backlog in the judiciary, India employs two AI platforms, SUPACE and SUVAS, to allocate cases and triage filings (Sharma, 2023, p. 109). SUPACE, which stands for Supreme Court Portal for Assistance in Courts Efficiency, is an AI-driven portal launched by the Supreme Court of India to help judges manage case data, assist with research, data analysis, and drafting support without replacing judicial decision-making. The other tool, SUVAS, is an AI-powered translator developed by the Supreme Court of India to translate English judicial documents, orders or judgments into multiple Indian regional languages, promoting the use of vernacular languages in legal proceedings.

According to “the Guidance for Judicial Office Holders”, published in April 2025, the UK allows generative AI for administrative drafting but forbids it in substantive reasoning. It requires all outputs to remain under human supervision (Judiciary of England and Wales, 2025). Similarly, the fresh from the press, “Interim Principles and Guidelines on the [Canadian] Courts’ Use of AI”, “human in the loop” and deep transparency for AI application is a requirement (Federal Court of Canada, 2025).

One gets the impression that while the abovementioned systems offer speed, scalability, and accessibility benefits, their implementation must be grounded in robust regulatory and ethical frameworks.

2.1.4. Multimodal courtroom technologies

Finally, multimodal courtroom technologies extend AI application beyond text into other types of sensory data like audio, video, body language (such as eye movements), and physiological signals. These systems assist judges and litigants by providing objective means to assess witness behaviour, truthfulness, and even understand the courtroom dynamics.

Joshi et al. (2025, p. 11) developed the “CogniModal-D dataset”, which combines EEG, ECG, EOG, eye-gaze, audio, video, and skin responses to train models that detect deception, reaching up to 79% accuracy. They found that behavioural signs like tone, movement and eye contact proved to be easier to interpret than neurophysiological signals. The move to multimodal data allows for richer and more nuanced evidence assessment, but it also raises serious ethical concerns about privacy, consent and reliability of the data.

These technologies seem to represent a new stage in judicial AI, where e-courts may not only analyse text and data but also observe, hear and sense. Therefore, careful empirical research and legal scrutiny appear vital before these systems are widely adopted – if at all?

Overall, based on the above, a clear trend emerges, namely that courts worldwide are not just digitising processes but carefully balancing and negotiating new technology with oversight. Smart courts, predictive analytics, sophisticated document management, and multimodal evidence, each promise efficiency gains, yet they also introduce ethical, procedural and institutional dilemmas. How can justice embrace speed without sacrificing fairness?

To assist in answering this, Table 1 provides a snapshot of AI use in judiciary worldwide, listing employed technologies, their maturity and the policy frameworks that accompany them. These data highlight both the broad experimentation in courts and the uneven rate of change.

2.2. Regulatory, governance and technical frameworks

As the justice sector embraces AI, a complex web of regulatory initiatives has emerged to steer this transition responsibly. The judiciary now faces the challenge of integrating autonomous systems without undermining fundamental justice principles, leading to a surge in international and national rules designed to ensure transparency and human control. A primary milestone is the EU AI Act (Regulation 2024/1689), which classifies judicial AI as “high-risk,” demanding the highest level of regulatory scrutiny. It requires systems to have detailed documentation, high data quality to minimise bias, and immutable logging for later analysis. Crucially, it mandates that judges must be able to understand and challenge AI outputs. These obligations were originally to apply from 2 August 2026. Regulation (EU) 2026/1744 (the Digital Omnibus on AI), in force since 27 July 2026, postponed the application of the Annex III high-risk requirements to 2 December 2027, and those for Annex I embedded systems to 2 August 2028, without altering the classification of judicial AI as high-risk.

Long before binding laws, the Ethical Charter (CEPEJ, 2018) established core principles, prioritising fundamental rights over mere technological efficiency. The Charter calls for explainability, technical reliability, and, most decisively, “human-in-the-loop” oversight, reminding institutions that algorithms must assist rather than replace judicial reasoning. Beyond the AI Act, other European instruments like the EU Data Act (2023), the EU Data Governance Act (2022), and the AI Liability Directive proposed in 2022 and formally withdrawn by the European Commission in October 2025 collectively shape a framework intended to reinforce trust in digital transformation.

At the global level, the OECD AI Principles (2019) and UNESCO AI Recommendation (2021) form the normative backbone for worldwide governance, balancing innovation with accountability. UNESCO’s Global Toolkit

(2023) emphasises fairness and participatory dialogue, framing AI in justice as a social project requiring public trust and continuous ethical reflection.

Complementing these legal boundaries are technical standards, such as the NIST Risk Management Framework (2023) and the ISO AI Risk Management (2023) standard. Together, they offer a technical scaffolding of auditing and regular checks to ensure broad ethical principles translate into measurable operational standards.

This multi-layered ecosystem reflects a cautiously hopeful approach, ensuring that efficiency gains never come at the expense of fairness or the fundamental human authority of the courts.

2.3. Poland: digitalisation and AI in judicial administration

Over the past decade, Poland's judiciary has been, quite frankly, on quite an ambitious journey of digital transformation. This effort is not just about making things faster – though that is certainly part of it – but also about making justice more accessible and transparent. At the heart of this effort lie two key pieces of legislation: the Act on Computerisation of Public Administration and the Civil Procedure Code. Together, they provide the legal right for electronic communication with courts, laying a solid foundation for a fully digitised judicial process (Computerisation Act, 2005; Civil Procedure Code, 1964).

Now, it is important to remember that Poland is not doing this in isolation. These reforms are deeply intertwined with the aforementioned evolution of Europe's digital and ethical framework. For example, in response to the developments on the EU AI front, Poland's Ministry of Digital Affairs initiated an extensive consultative process on the Draft Act on AI Systems in late 2024. In December 2024, a draft AI Systems Act was opened up to scrutiny by over 2000 stakeholders – judges, technologists, academics and civil groups – encouraging broad feedback on oversight mechanisms (Ministerstwo Cyfryzacji, 2024). By February 2025, proposals included forming a Commission on the Development and Safety of AI to coordinate responsible AI use across public bodies. The Act of 3 July 2026 on AI Systems was signed by the President on 24 July 2026 and promulgated on 27 July 2026 (Journal of Laws 2026, item 1003). It entered into force, as a rule, on 11 August 2026, while the provisions on inspections, proceedings, individual opinions and administrative fines apply from 28 October 2026. The Act establishes the institutional framework for implementing the EU AI Act in Poland, designating the Commission for the Development and Security of Artificial Intelligence (KRiBSI) as the market surveillance authority.

Hopefully, guided by the AI Development Policy to 2030 and the justice digitalisation agreement signed in April 2025, Polish courts are on the verge of significant transformation. The Ministries of Justice and Digitisation

committed to comprehensive court digitalisation, which is framed within a broader programme known as Digital Court (Ministerstwo Sprawiedliwości & Ministerstwo Cyfryzacji, 2025). This programme includes several ambitious projects, such as:

- The Judge’s Digital Assistant, which automates various judicial tasks in complex case types, like those involving Swiss Frank. This assistant incorporates an extensive database of European Court of Justice rulings, calculation tools, and automated document drafting capabilities. Pilots began in late 2024 and are progressively advancing.
- The Electronic Summons Proceedings System 3.0, which integrates automated communication, data extraction, and system interoperability with national registers such as KRS, CEIDG, and others.
- The Central Repertory and Clerical System, aimed at standardising digital case files across regional courts and automating document categorisation and workflows.
- Revamping the court’s Information Portal for seamless electronic submissions, interactive communication channels, and unified user interfaces supporting electronic signatures.

Together, these efforts are designed to address core administrative burdens, enhance the security and auditability of judicial data, and improve access and convenience for citizens and legal professionals alike. A crucial feature is ensuring interoperability across systems and avoiding “digital islands” thus building a coherent and scalable digital court system.

To support this systemic shift, the government has earmarked PLN 50 million to train more than 60 000 judges and court staff (Ministerstwo Sprawiedliwości, 2025b). The aim is to build not only technical expertise but also institutional trust in AI-assisted administration.

To grasp why these reforms are so urgent, one only needs to consider the sheer workload of Polish courts. In 2024 alone, over 14.6 million cases were processed, producing between seven and eight kilometres of paper files per appellate region every year (Ministerstwo Sprawiedliwości, 2025a). This staggering volume reveals the enormous administrative burden traditional procedures impose and the tremendous potential gains from comprehensive digitalisation. As Kowalski (2025, p. 437) observes, automating repetitive, labour-intensive tasks – from registering cases to assigning file numbers or sending correspondence – can relieve enormous pressure on court staff, allowing human resources to focus on work requiring discretion and judgement.

In this context, judicial administration has already begun integrating AI tools directly within the e-court infrastructure, transforming what used to be routine clerical tasks into intelligent process management. For instance, the following have already been piloted:

- Machine-learning classifiers that automatically sort incoming documents by case type, drastically speeding up docket processing.

- Natural-language tools designed to recognise urgent filings instantly, ensuring swift prioritisation of time-sensitive matters.
- Conversational chatbots to guide litigants through procedures, deadlines, and forms, making navigating the justice system less intimidating and fairer (Ministerstwo Sprawiedliwości, 2025a).

Importantly, it appears that each prototype system undergoes thorough, modular testing before any nationwide deployment. For example, the Wrocław Appellate Court's Information Portal pilot programme zeroes in on optimising user experience and streamlining electronic workflows, influencing future regional rollouts (Ministerstwo Sprawiedliwości, 2025b). This effort is overseen by an Interdisciplinary Team for Modern Technology Implementation, which pulls together experts from the National Prosecution Service, Attorney General's Office, judiciary, and academia. Acting as what seems to be a collaborative think tank, they have been tasked with diagnosing institutional needs, consulting professional groups such as bar associations, notaries, and bailiffs, and drafting long-term strategies (Ministerstwo Sprawiedliwości, 2025b).

When it comes to technical infrastructure, one standout is the LEX-AIS system developed by Gdańsk University of Technology. It provides near-real-time, AI-powered courtroom transcription with over 98% accuracy, trained on a massive corpus of half a million rulings. This promises to speed hearings by up to 50%. After successful phase two pilots in four courts during 2024, expansion to 100 courts is planned before national roll-out (Gdańsk University of Technology, 2024). Similarly, AI-augmented arbitration pilots early in 2024 revealed time savings exceeding 60% – all without compromising human arbitrators' ultimate authority (Ministerstwo Sprawiedliwości, 2024).

It is worth noting that Polish scholarship does attempt to address the development of AI in the Polish judiciary. The book by Dolniak et al. (2024) on AI in the judiciary provides a foundational overview of the regulatory and institutional environment as of mid-2024. It maps the early policy frameworks, including Polish 2020 AI strategy, the AI Working Group (GRAI) recommendations, the Ministry of Justice's April 2023 "Ius ex silico. AI in the service of the judiciary" conference as well as documents stakeholder attitudes captured in the January 2024 survey by the Ministry of Justice. While the book undoubtedly offers a broad interdisciplinary treatment of civil, criminal and procedural law perspective, its primary focus remains legal doctrine rather than management. Moreover, given the accelerating pace of AI development and implementation, the institutional landscape the monograph describes has already shifted considerably in the intervening period.

Where Dolniak et al. (2024, p. 58) document an early consultative phase marked by low engagement (just 1.8% of judges and 4% of administrative staff) and mainly aspirational strategies, this review instead reflects the first tentative steps toward real-world implementation. By late 2024 and early 2025, Poland had already progressed from surveying potential AI uses to

piloting concrete systems, i.e. the LEX-AIS courtroom transcription, AI-assisted arbitration platforms and the broader Digital Court Programme. This rapid shift underlines both the dynamism of judicial AI adoption and the need for management-focused scholarship that goes beyond legal and ethical questions to examine the organisational, budgetary and change-management challenges essential for sustaining technological improvements in court administration.

It seems that combining legislative, technological, and educational initiatives with a strategic long-term vision, Poland might just be positioning itself at edge of judicial digitalisation. However, challenges remain. The urban-rural digital divide risks perpetuating inequities in accessing efficient justice. Concerns around algorithmic opacity, bias, and cybersecurity vulnerabilities to name a few.

Ultimately, success in Poland's judicial digitalisation likely rests not on technology alone but on sustained commitment to trust, transparency, and human oversight. Continued dialogue with stakeholders and strong ethical safeguards are essential to ensure innovation bolsters, rather than threatens, judicial independence and legitimacy.

2.4. Ethics and risks in the application of AI to court systems

The integration of AI into judicial processes introduces ethical risks that demand targeted management to uphold the rule of law and public trust. When an algorithm recommends a sentence or triages a case, it interferes with transparent, adversarial processes. Algorithmic decision support may obscure reasoning or introduce procedural shortcuts that infringe upon the right to a fair trial under Article 6 of the ECHR (Selcuk et al., 2025, p. 1). If reasoning is hidden inside a “black box”, procedural safeguards protecting the innocent are compromised. AI must support, not replace, human judgement.

The principle that justice must be “seen to be done” underpins public confidence; however, “black-box” systems conflict with this tenet. When a judge cannot explain an AI recommendation, or a litigant is told to “trust the algorithm,” judicial authority crumbles (de la Osa & Remolina, 2024, pp. 4–5; Teremetskyi et al., 2025, p. 128). Mandatory explainability and accessible documentation are essential to maintaining the social contract between courts and citizens. Furthermore, AI systems can encode societal prejudices from training data, leading to discriminatory outcomes. The US COMPAS tool illustrates this, as studies found it disproportionately labelled African American defendants as high-risk regardless of offence severity (Selcuk et al., 2025, p. 6; Teremetskyi et al., 2025, p. 129). Regular audits and inclusive data curation are necessary to ensure AI serves all individuals fairly.

Judicial independence is also at risk if overreliance on algorithms shifts authority to opaque systems designed by private vendors - a phenomenon termed

“algocracy” (de la Osa & Remolina, 2024, p. 9; Florez Rojas, 2025, pp. 110–111). Clear protocols must reserve final authority to human judges so that algorithms advise rather than command. Surveys show that people trust human judges more than AI, especially in high-stakes contexts (de la Osa & Remolina, 2024, p. 5; Teremetskyi et al., 2025, p. 128). Vulnerable litigants may perceive AI-driven processes as arbitrary, eroding institutional legitimacy. Rebuilding trust requires transparent governance and inclusive dialogue.

Liability presents another challenge: when AI misinterprets evidence or recommends unjust outcomes, accountability gaps complicate redress (de la Osa & Remolina, 2024, pp. 20–21). Contractual frameworks and audit trails are vital to ensure technology does not shield institutional irresponsibility. Additionally, processing sensitive judicial data heightens privacy risks, especially with third-party vendors (de la Osa & Remolina, 2024, p. 8; Teremetskyi et al., 2025, p. 129). Data breaches could have severe consequences, making encryption and informed-consent moral imperatives.

Generative AI “hallucinations” – fabricating citations or precedents – further undermine reliability (de la Osa & Remolina, 2024, pp. 7–8). The *Mata v. Avianca, Inc.* case serves as a warning after a lawyer submitted a brief with non-existent cases generated by ChatGPT. Finally, the digital divide risks creating a two-tiered justice system where those without digital literacy face a slower process (Teremetskyi et al., 2025, p. 128; de la Osa & Remolina, 2024, pp. 9–11). Mitigating these risks requires multi-layered frameworks embedding transparency and human oversight throughout the AI lifecycle.

3. Methods

This study employed a systematic literature review guided by PRISMA principles to ensure transparency and reproducibility in mapping, evaluating and interpreting scholarship on AI applications in judicial management systems from 2015 to 2026. In October 2025, two multidisciplinary databases were searched to capture both technological and legal perspectives.

On Scopus, the following Boolean query was used in TITLE-ABS-KEY fields: (“AI” OR AI OR “machine learning”) AND (judiciary OR “court management” OR “court administration” OR “justice management” OR “judiciary management” OR “judicial administration” OR “judicial management” OR “court case management” OR “e-justice” OR “smart court”) AND PUBYEAR > 2014 AND PUBYEAR < 2027.

This retrieved 336 records (121 open access). An equivalent strategy in the Web of Science Social Sciences Citation Index returned 143 records (62 open access). To accommodate institutional access limits, only open access publications (n = 183) were retained. After removing duplicates, 119 unique articles progressed to screening.

Rigorous inclusion and exclusion criteria were then applied. Eligible studies were peer-reviewed articles from 2015–2026, written in English or Polish, and directly addressed AI or machine learning in judicial systems, court management or administration. They encompassed empirical research, case studies, theoretical frameworks or policy analyses with clear practical implications and touched on at least three thematic categories of the review framework. Excluded works included conference papers, book chapters, general AI-ethics discourse lacking judicial focus, and highly abstract or redundant studies.

The selection process unfolded in two phases. First, titles and abstracts of all 119 articles were reviewed for thematic relevance, prioritising those that covered multiple aspects of AI in courts, such as case triage, decision support and ethical governance, which resulted in 75 papers for full-text assessment. Detailed evaluation against the inclusion/exclusion criteria followed, leading to the exclusion of seventeen articles for insufficient managerial focus ($n = 6$), overly theoretical orientation ($n = 6$) or limited novelty ($n = 5$). Ultimately, 58 studies met all criteria and formed the qualitative synthesis underpinning this review.

Consequently, this review offers a robust cross-section of empirical and conceptual work, enabling the identification of distinct global adoption patterns, risk-governance strategies and institutional adaptation models, and situating Poland's trajectory within the broader international landscape.

4. Results

The review highlights three overlapping trends shaping AI-driven court management, namely operational automation, ethical safeguards, and institutional risk. It also examines how they play out in both global experiments and Poland's pilot schemes. Together, these themes reveal how technical advances, governance measures, and systemic barriers intertwine to influence the adoption of AI in the judiciary management.

On the automation front, China's Smart Court offers a prime example, since it employs big-data analytics, blockchain, and AI to streamline case triage and even forecast outcomes. Yet critics warn that such deep centralisation could threaten judicial independence (Shi et al., 2021, pp. 12–18). In Estonia, the e-File pilot expedites submissions without marginalising judges, striking a balance between efficiency and discretion (de la Osa & Remolina, 2024, pp. 9–10).

Equally vital are the ethical and governance measures that underpin legitimate AI use in courts. Opaque “black-box” algorithms in sentencing models have prompted urgent calls for transparency and explainability, ensuring all stakeholders can comprehend decisions (de la Osa & Remolina, 2024, pp. 4–5; Teremetskyi et al., 2025, p. 128). Following the uncovering of discriminatory

risk pathways in systems like COMPAS, bias-mitigation strategies now emphasise continuous monitoring and third-party audits (Selcuk et al., 2025, p. 6; Teremetskyi et al. 2025, p. 129). The concept of algocracy offers six dimensions of legitimacy-transparency, accountability, fairness, efficiency, participation, and reversibility in order to guide democratic oversight of AI in courts (Flores Rojas, 2025, pp. 110–111). Notably, New Zealand's assault-sentence model demonstrates that predictive accuracy and interpretability can coexist when outputs are co-designed with judges (Rodger et al., 2023).

However, institutional risks pose significant hurdles, particularly in emerging democracies. It might be because, as comparative studies suggest, adoption trajectories depend more on political leanings, administrative complexity, and regional technology diffusion than on technical abilities alone (Guitton et al., 2025). Advanced technology alone cannot drive transformative change. Without concerted efforts to modernise legacy systems, improve data accessibility, and bolster judicial resources, AI risks remaining an unfulfilled promise. Effective adoption demands a holistic strategy that aligns technical innovation with ethical oversight and capacity building.

Furthermore, courts across jurisdictions confront three primary challenges, in the form of entrenched reluctance, fragmented non-machine-readable records, and severe resource shortages, which impede tool deployment and erode public trust (Yoon, 2023, pp. 355–362).

Fortunately, overlaying these themes, there is a regulatory framework, i.e. the EU AI Act, which imposes strict requirements for documentation, data quality control, immutable audit logs, and explainability to protect due process. Complementary requirements, from the CEPEJ Ethical Charter to the OECD AI Principles and UNESCO's AI Recommendation, reinforce inclusive governance, transparency, and ongoing skill development.

Poland's own forays into AI-augmented court management reflect both ambition and caution. Pilots such as the AI-supported case-triage system and the LEX-AIS courtroom transcription project at Gdańsk University of Technology have delivered measurable efficiency gains while preserving essential human oversight (Gdańsk University of Technology, 2024). From a governance perspective, the Digital Court Programme, aligned with the EU AI Act's high-risk safeguards, provides a robust regulatory foundation for further innovation. Yet uneven digital infrastructure across regional courts hampers seamless e-filing and real-time analytics, and limited training opportunities leave judges and staff hesitant to embrace new tools. Moreover, persistent non-machine-readable case files and constrained budgets continue to reinforce the three systemic barriers that is reluctance, fragmentation as well as resource scarcity that courts worldwide must overcome before AI can fulfil its transformative potential (Yoon, 2023, pp. 355–362).

Furthermore, survey data collected in 2023 and published by the Ministry of Justice in early 2024 (Ministerstwo Sprawiedliwości, 2024, pp. 4–6) pro-

vide critical insight into judicial attitudes towards digitalisation and AI adoption at a formative moment. The survey found very low overall engagement in digitalisation, showing these tools were still at an early stage of adoption. Judges were keen on automatic hearing transcripts, text recognition and AI help with drafting decisions, while administrative staff mainly appreciated easier access to court files. Employees with mid-level experience were the most open to digital tools, whereas those with very long service were the least enthusiastic. Although most judges and assessors supported fully digital case files, a substantial minority of referendaries and administrative personnel opposed the change.

These findings underscore both the heterogeneity of expectations across occupational groups and the persistence of generational and institutional barriers. They highlight the necessity for tailored training programmes and differentiated implementation strategies rather than uniform roll-outs. When set against more recent developments, including the expansion of the LEX-AIS transcription system and the allocation of PLN 50 million for capacity building, the 2023 data show courts have come a long way but warn that progress may stay limited to a few pioneering courts. Understanding this starting point is essential for assessing whether current initiatives can achieve long-term system-wide integration.

In short, Poland stands at a crossroads: unless it synchronises cutting-edge technical solutions with sustained capacity building and ethical governance, its judicial AI initiatives risk remaining cautious experiments rather than enduring, equitable digital practices.

5. Conclusion

This review reveals a pressing gap in understanding how AI affects court management in specific national contexts. Although abundant research examines AI's technical capabilities and normative frameworks, little attention has been paid to the practical impact of AI tools on administrative workflows, judicial discretion, and institutional legitimacy. Poland's transitional judiciary provides a particularly rich case for exploring these dynamics.

Future studies should investigate how AI reshapes routine management tasks, such as case triage, scheduling, and document processing as well as how and if judges and court staff incorporate algorithmic support into their decision-making processes. Equally important is assessing how oversight and audit mechanisms translate regulatory intent into effective controls that preserve human judgement and maintain public confidence in court administration. The author intends to address these questions in future research to produce actionable evidence on how AI can be used in the judiciary to enhance efficiency while safeguarding judicial independence and upholding public trust.

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Appendix

Table 1. Comparative overview of AI applications in judicial systems worldwide

Jurisdiction	Type of AI technology	Implementation stage
Australia	NLP triage, remote hearings assistance	National rollout
Brazil	NLP for text simplification and summarisation	National implementation
Canada	Automated decision-making tools (AI-assisted judgements)	Interim policy (September 2025)
China	Big data analytics, blockchain, decision-making AI	Nationwide deployment
Estonia	Automated filing, experimental AI-judge modules	Advanced pilots
France	Statistical outcome prediction	Pilot initiatives
Germany	Machine learning for case triage	Early adoption
India	Speech recognition, NLP document processing	Pilot and regional rollout
Netherlands	Online portals, predictive case analytics	Established system
New Zealand	Automated filing, virtual hearings	Pilot and regional rollout
Poland	Electronic document exchange, e-case management	Pilot and regional rollout
South Africa	Automated filing and OCR	Nationwide deployment
Spain	Case management analytics, e-filing	Pilot initiatives
United Kingdom	Generative AI for non-substantive judgement drafting	Guidance issued (April 2025)
United States	IBM Watson-based triage and document analysis	Early rollout

Source: Own preparation based systematic literature review and policy documents including international reports and national judicial AI initiatives.