

Artificial Intelligence and the Transformation of Legal Systems

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ABSTRACT

The deployment of artificial intelligence across judicial administration, legal practice, and regulatory enforcement is transforming the institutional infrastructure of legal systems in ways that outpace existing doctrinal categories of accountability, due process, and authorship. This chapter considers the use of algorithmic risk assessment and decision-support tools in adjudication, the challenges of algorithmic opacity and bias for constitutional guarantees of fairness, the contested question of artificial intelligence as an inventor or author under intellectual property law, and the emerging global regulatory response exemplified by the European Union's Artificial Intelligence Act. It situates India's own engagement with judicial artificial intelligence tools, including SUPACE and SUVAS, within this comparative framework, and argues that legal systems must develop calibrated doctrines of algorithmic accountability that neither uncritically defer to automated systems nor forfeit the efficiency gains such systems can offer..

Keywords: artificial intelligence; algorithmic accountability; AI regulation; judicial technology; automated decision-making; AI and intellectual property.

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Introduction

Artificial intelligence has moved from a peripheral technical curiosity to a central infrastructural feature of contemporary legal systems, deployed in domains ranging from predictive policing and bail risk assessment to contract review, legal research, and judicial translation. This transformation raises questions that classical legal doctrine is only beginning to address: whether decisions materially assisted or generated by algorithmic systems satisfy constitutional and administrative law standards of reasoned decision-making, whether the opacity of many machine learning systems is compatible with due process guarantees of transparency and contestability, and whether existing categories of legal personhood, authorship, and liability can accommodate outputs generated markedly without direct human intervention. This chapter surveys these questions, situating them within both comparative regulatory developments and India's own emerging engagement with judicial and legal technology.

The stakes of this inquiry are heightened by the pace at which artificial intelligence capabilities have advanced relative to the comparatively slower pace of legal and regulatory adaptation, a mismatch that has left many legal systems addressing AI-related harms through analogical extension of doctrines developed for earlier technologies, pending the development of AI-specific legal frameworks that more precisely track the distinctive characteristics of algorithmic decision-making, including its capacity for scale, its frequent opacity, and its ability to identify statistical patterns that may correlate with, and thereby indirectly reproduce, legally protected characteristics even where such characteristics are not directly used as inputs.

Algorithmic Decision-Making in Adjudication

The use of algorithmic risk assessment tools in criminal justice has generated the most extensively litigated body of jurisprudence on artificial intelligence and adjudicative fairness. In *State v. Loomis*, the Wisconsin Supreme Court considered a challenge to the use of the COMPAS recidivism risk assessment tool at sentencing, where the defendant argued that reliance on a proprietary algorithm whose methodology was not disclosed to him violated due process. The court permitted continued use of the tool subject to cautionary disclaimers about its limitations, while declining to require disclosure of the foundational proprietary algorithm, a holding that has been widely criticized for permitting consequential liberty determinations to rest on undisclosed methodology.¹ Danielle Keats Citron's earlier account of 'technological due process' anticipated precisely this difficulty, arguing that automated decision systems affecting individual rights require procedural safeguards functionally equivalent to those developed for human administrative decision-making, including meaningful notice of the factors considered and a genuine opportunity to contest algorithmic determinations.²

Frank Pasquale's account of the 'black box society' situates this problem within an overarching critique of algorithmic opacity across both public and private decision-making, arguing that the proprietary and technical complexity of contemporary algorithmic systems has produced a systemic accountability deficit that existing transparency and disclosure regimes are ill-equipped to address.³ Cathy O'Neil's parallel study documents how algorithmic systems trained on historical data can encode and perpetuate existing social biases at scale, particularly where such systems are deployed in domains such as sentencing, credit, and employment that directly affect fundamental interests, generating what she terms 'weapons of math destruction' whose harms are magnified precisely by their appearance of mathematical objectivity.⁴

Accountability, Explainability, and Legal Standards

¹State v. Loomis, 881 N.W.2d 749 (Wis. 2016).

²Danielle Keats Citron, 'Technological Due Process' (2008) 85 Washington University Law Review 1249.

³Frank Pasquale, *The Black Box Society: The Secret Algorithms That Control Money and Information* (Harvard University Press, 2015).

⁴Cathy O'Neil, *Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy* (Crown, 2016).

Legal scholarship has developed several frameworks for imposing accountability on algorithmic systems even though their technical opacity. Joshua Kroll and co-authors argue that meaningful algorithmic accountability need not depend on full public disclosure of source code, which may in any event be uninformative to non-technical reviewers, but can instead be achieved through technical mechanisms such as procedural regularity verification, algorithmic auditing, and cryptographic commitment schemes that allow verification of consistent rule application without full disclosure of proprietary methodology.⁵ Andrew Tutt has proposed an institutional response modelled on pharmaceutical regulation, arguing for a dedicated regulatory body empowered to require pre-market testing and ongoing monitoring of algorithmic systems deployed in consequential domains, drawing an explicit analogy to the Food and Drug Administration's role in regulating the safety and efficacy of medical products before market release.⁶

The European Union's General Data Protection Regulation incorporates a partial statutory response to these concerns through Article 22, which grants data subjects the right not to be subject to a decision based solely on automated processing that produces legal effects or similarly notably affects them, subject to specified exceptions and accompanied by rights to obtain human intervention, to express one's point of view, and to contest the decision.⁷ India's Digital Personal Data Protection Act, 2023, by contrast, does not contain a directly equivalent provision addressing automated decision-making, leaving the extension of due-process-style protections to algorithmic determinations to be developed through constitutional adjudication under the Puttaswamy proportionality framework rather than through dedicated statutory text.⁸

This legislative gap is likely to become increasingly consequential as Indian public and private institutions expand their reliance on algorithmic scoring and eligibility-determination systems in domains such as credit assessment, insurance underwriting, and welfare benefit administration, each of which affects appreciable individual interests and each of which has, in comparative experience, proven susceptible to the kinds of opacity and embedded bias concerns that Pasquale and O'Neil identify. Whether Indian courts will develop a domestically calibrated equivalent to Article 22 of the GDPR through constitutional interpretation, or whether such protection will instead require dedicated legislative intervention, remains one of the more consequential open questions in Indian technology law.

The Global Regulatory Response: The EU AI Act and Comparative Frameworks

The most wide-ranging legislative response to date is the European Union's Artificial Intelligence Act, which establishes a risk-tiered regulatory framework classifying AI systems as posing unacceptable, high, limited, or minimal risk, prohibiting certain uses outright, such as social scoring by public authorities and specified forms of biometric categorisation, while imposing extensive conformity assessment, documentation, and

⁵Joshua A. Kroll et al., 'Accountable Algorithms' (2017) 165 University of Pennsylvania Law Review 633.

⁶Andrew Tutt, 'An FDA for Algorithms' (2017) 69 Administrative Law Review 83.

⁷Regulation (EU) 2016/679 (General Data Protection Regulation), Article 22.

⁸Justice K.S. Puttaswamy (Retd.) v. Union of India, (2017) 10 SCC 1, applying the proportionality standard to state action affecting informational and decisional autonomy.

human oversight obligations on high-risk systems deployed in domains including law enforcement, employment, and access to essential services.⁹ The Organisation for Economic Co-operation and Development's Recommendation on Artificial Intelligence, though non-binding, has exercised marked normative influence on subsequent national AI strategies by articulating principles of inclusive growth, human-centred values, transparency, robustness, and accountability that a growing number of jurisdictions, including India, have referenced in framing their own domestic approaches.¹⁰ UNESCO's Recommendation on the Ethics of Artificial Intelligence, adopted by its General Conference, similarly articulates a values-based framework emphasising human dignity, environmental sustainability, and diversity, intended to guide member states in developing domestic AI governance frameworks even in the absence of binding international obligation.¹¹

India's regulatory approach has to date remained substantially non-binding and strategic rather than legislative. NITI Aayog's National Strategy for Artificial Intelligence articulated a vision for AI deployment across healthcare, agriculture, education, and smart infrastructure, emphasising India's potential comparative advantage as an AI 'garage' for the developing world, while acknowledging the need for accompanying frameworks addressing privacy, security, and ethical deployment.¹² The absence of a dedicated binding AI statute in India, in contrast to the European Union's far-reaching Act, has generated ongoing policy debate over whether existing sectoral and constitutional frameworks are adequate to address AI-specific harms, or whether dedicated legislation modelled on comparative frameworks is required.

Judicial Artificial Intelligence in India

India's judiciary has itself begun deploying artificial intelligence tools intended to improve judicial efficiency rather than to substitute for adjudicative judgment. The Supreme Court Portal for Assistance in Courts' Efficiency, commonly known by its acronym, was introduced as an artificial intelligence research assistance tool intended to help judges access relevant case law, legislative provisions, and factual summaries more efficiently, without itself rendering adjudicative determinations. The Supreme Court Vidhik Anuvaad Software similarly employs machine translation to render judicial orders and judgments into regional Indian languages, addressing a longstanding access-to-justice barrier arising from the predominance of English in appellate judicial reasoning.

These deployments embody a deliberate institutional choice to confine artificial intelligence to a decision-support rather than decision-making function within the Indian judicial system, distinguishing this approach from jurisdictions such as the United States, where algorithmic risk assessment tools of the kind considered in Loomis have been used to directly inform consequential judicial determinations affecting liberty. Whether

⁹Regulation (EU) 2024/1689 laying down harmonised rules on artificial intelligence (Artificial Intelligence Act), Articles 5-6 and Annex III.

¹⁰OECD, Recommendation of the Council on Artificial Intelligence, OECD/LEGAL/0449 (2019).

¹¹UNESCO, Recommendation on the Ethics of Artificial Intelligence, adopted by the General Conference at its 41st session (2021).

¹²NITI Aayog, National Strategy for Artificial Intelligence #AIforAll (Government of India, June 2018).

this distinction between decision-support and decision-making functions can be sustained as such tools become more sophisticated and more deeply embedded in judicial workflow remains an open question for Indian legal and judicial administration, particularly given the human tendency toward automation bias, whereby human decision-makers may defer excessively to algorithmic recommendations even when nominally retaining final authority.

Artificial Intelligence and Intellectual Property Authorship

Artificial intelligence also poses distinctive challenges to intellectual property doctrine's traditional anchoring of authorship and inventorship in natural persons. In *Thaler v. Comptroller-General of Patents, Designs and Trade Marks*, the United Kingdom Supreme Court considered whether an artificial intelligence system, DABUS, could be named as the inventor on a patent application, holding that under the Patents Act 1977 an inventor must be a natural person and that an AI system, however capable, cannot itself hold or transfer inventorship rights under the existing statutory scheme.¹³ The Indian Patent Office's Guidelines for Examination of Computer Related Inventions similarly proceed on the premise that patentable inventions must be attributable to human inventive activity, addressing the patentability of computer-implemented inventions generally without directly resolving the more specific question of autonomous AI-generated inventions.¹⁴

This doctrinal conservatism, replicated across most major patent jurisdictions that have considered the question, captures a more general unresolved tension in intellectual property theory between the traditional justification for authorship and inventorship rights grounded in the recognition and incentivisation of individual human creativity, and the practical reality that AI systems can now generate outputs that are functionally indistinguishable from, and in some domains qualitatively comparable to, human-authored creative or inventive work. Legal systems have thus far responded by preserving the human-authorship requirement rather than extending legal personhood to AI systems themselves, a position that channels AI-related authorship disputes toward the human developers, trainers, or operators of such systems rather than toward the systems as autonomous legal actors.

Liability for Artificial Intelligence-Caused Harm

The deployment of increasingly autonomous AI systems in domains such as transportation, healthcare diagnostics, and financial decision-making raises distinctive challenges for existing tort and product liability doctrine, which was developed largely around discrete, foreseeable failure modes attributable to identifiable manufacturing or design defects. Where an AI system's outputs are generated through machine learning processes whose precise decisional logic is not fully specified or predictable even by its own developers, conventional negligence analysis, which typically requires identification of a specific breach of a duty of

¹³*Thaler v. Comptroller-General of Patents, Designs and Trade Marks*, [2023] UKSC 49.

¹⁴Indian Patent Office, Guidelines for Examination of Computer Related Inventions (Office of the Controller General of Patents, Designs and Trade Marks, 2017).

reasonable care, becomes markedly more difficult to apply, since the harm-causing behaviour may emerge from patterns in training data rather than from any discrete design choice that a human developer could have foreseen and avoided.

The European Union's proposed Directive on adapting non-contractual civil liability rules to artificial intelligence sought to address this evidentiary difficulty by introducing a rebuttable presumption of causality in specified circumstances, easing the burden on claimants who would otherwise face marked difficulty proving the causal link between an AI system's internal decisional process and the harm suffered, while leaving the core fault-based liability framework of existing national tort law largely intact.¹⁵ This proposal has been considered alongside potential amendments to the Union's long-standing product liability framework, originally established through Directive 85/374/EEC, which imposes strict liability on producers for defective products without requiring proof of fault, and which has been the subject of proposals to extend its application explicitly to software and AI systems that were not clearly contemplated when the original directive was adopted.¹⁶ India's existing consumer protection and tort framework has not yet developed a comparable AI-specific liability regime, leaving claimants harmed by autonomous or semi-autonomous AI systems to proceed under general principles of negligence and, where applicable, the Consumer Protection Act, 2019, without the benefit of a specifically calibrated evidentiary presumption of the kind proposed in the European Union.

Ryan Calo's overarching analysis of robotics and cyberlaw cautions against assuming that legal frameworks developed for earlier waves of internet-related litigation translate seamlessly to physically embodied or highly autonomous AI systems, arguing that the physical instantiation of robotics and increasingly autonomous decision-making introduces distinctive harms, including direct physical injury and emergent behaviour not fully anticipated by any individual line of code, that existing cyberlaw doctrine developed primarily for informational harms is not well equipped to address without notable doctrinal adaptation.¹⁷ This caution is of direct relevance to India's own developing approach to autonomous vehicle regulation and AI-assisted medical devices, both domains in which physical harm, rather than purely informational or economic harm, is the primary risk that any eventual liability framework will need to address.

Artificial Intelligence, Online Dispute Resolution, and Access to Justice

Beyond its implications for adjudicative fairness and liability, artificial intelligence has also generated meaningful interest as a mechanism for expanding access to justice, particularly through online dispute resolution platforms that combine AI-assisted case triage, negotiation support, and, in some implementations, automated resolution of straightforward, high-volume, low-value disputes. Richard Susskind has argued that online courts and AI-assisted dispute resolution mechanisms offer a route to addressing the access-to-justice

¹⁵European Commission, Proposal for a Directive on adapting non-contractual civil liability rules to artificial intelligence (AI Liability Directive), COM(2022) 496 final.

¹⁶Council Directive 85/374/EEC of 25 July 1985 on liability for defective products.

¹⁷Ryan Calo, 'Robotics and the Lessons of Cyberlaw' (2015) 103 California Law Review 513.

deficit that conventional court systems, constrained by cost, delay, and geographic access barriers, have persistently struggled to close, particularly for disputes involving modest monetary stakes that do not justify the expense of conventional litigation.¹⁸ Ethan Katsh and Orna Rabinovich-Einy's account of the 'internet of disputes' similarly documents the rapid growth of online dispute resolution mechanisms, particularly in e-commerce contexts, arguing that such platforms represent a structurally distinct fourth party to dispute resolution processes, supplementing rather than merely digitising the traditional roles of the negotiating parties and any human mediator or adjudicator.¹⁹

India's own experimentation with technology-assisted access to justice has proceeded principally through the Tele-Law scheme administered under the Department of Justice, which connects citizens in underserved areas with panel lawyers through video conferencing facilities located at Common Service Centres, and through the e-Courts project's larger digitisation of case filing, listing, and payment processes. While these initiatives have thus far relied more heavily on video-conferencing and digital case management than on AI-driven dispute resolution as such, they establish an institutional and infrastructural foundation upon which more AI-intensive access-to-justice tools, including automated legal information chatbots and AI-assisted eligibility screening for legal aid, could plausibly be built as India's judicial technology infrastructure continues to mature.

Conclusion

The transformation of legal systems by artificial intelligence is proceeding unevenly across jurisdictions, ranging from the European Union's thorough risk-tiered statutory framework to India's currently more strategic, non-binding approach centred on sector-specific policy documents and carefully bounded judicial technology deployments. What unites these divergent regulatory trajectories is a shared deeper challenge: reconciling the efficiency, consistency, and access-to-justice benefits that artificial intelligence can offer legal systems with the due process, transparency, and accountability commitments that those systems exist to protect. As AI tools become further embedded within judicial administration, regulatory enforcement, and legal practice, the central task for legal systems will be to develop calibrated doctrines of algorithmic accountability that preserve meaningful human judgment and contestability at the points where automated systems most directly affect individual rights and liberties.

Richard Susskind's larger observation that legal professions have historically underestimated the pace and depth of technological disruption to legal practice remains a useful caution for legal educators and regulators alike: the gradual, decision-support-oriented deployment of AI tools within Indian courts and legal practice today may represent an early rather than a terminal stage of a substantially more extensive transformation of legal work, encompassing not only adjudication but legal research, transactional drafting, compliance

¹⁸ Richard Susskind, *Online Courts and the Future of Justice* (Oxford University Press, 2019).

¹⁹ Ethan Katsh & Orna Rabinovich-Einy, *Digital Justice: Technology and the Internet of Disputes* (Oxford University Press, 2017).

monitoring, and dispute resolution.²⁰ Preparing legal education and professional regulation for this trajectory, rather than merely reacting to it once fully realised, is likely to be among the more consequential institutional challenges facing legal systems over the coming decade.

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²⁰Richard Susskind, *Tomorrow's Lawyers: An Introduction to Your Future* (Oxford University Press, 2nd edn, 2017).