The Role of Technology in Ensuring Speedy Trials: A Critical Analysis of E-Courts, Virtual Hearings, and Digital Justice in India

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Abstract

Article 21 of the Indian Constitution, which provides for justice, is consistently violated by continuing pendency of cases and procedural inefficiencies. In recent years, technological advancement has also stood at the forefront of rationally simplifying judicial procedures and bringing the judiciary within reach. Computerized court complexes, e-hearings, case management software, and computerized records have transformed the dispensation of justice in India to a large degree. COVID-19 pandemic highlighted the potential of e-filing and video conferencing in preventing procedural delays and making the proceedings of courts faster. This research looks at the technological revolutionizing impact on judicial process, with especial emphasis on whether it has the potential to curb case backlog issue and secure the right to a fair trial. It examines the e-Courts Mission Mode Project, case tracking solutions based on artificial intelligence, and computerization of identification of electronic evidence in the context of the Bharatiya Sakshya Adhiniyam, 2023. Though these innovations are welcome, the paper also discusses concerns like infrastructural limitations, increasing cyber-attacks, privacy of data, and digital exclusion of the disadvantaged who are not connected. By gauging India's experiences against international standards, the study believes that technology has transformed court procedures. But actual efficiency will be with structural reforms that maximize judicial ability and provide equal access to legal protection. The study believes that harnessing technology along with reform can help the Constitution's promise of swift justice become a reality and simplify the debilitating logjam in the criminal justice system.

***Keywords**: Instant Justice, Digital Judiciary, Virtual Hearings, Electronic Courts, Judicial Reforms, Article 21 Criminal Justice Reforms, Bharatiya Sakshya Adhiniyam, 2023*

1. Introduction

The right to a trial is a fundamental aspect of international laws, with the aim of ensuring the protection of citizens suspected of crimes from undue captivity and lengthy judicial proceedings and maintaining the integrity of the organs of justice. States such as the United States (via the Sixth Amendment), India, the United Kingdom, and Canada have this right enshrined in their charters or codes of laws. Any such provisional restriction of liberty must

be subject to careful examination in respect of its grounds, the right of parties involved, and any resulting unfairness. The right can be very deeply embedded in the foundational charters. The Universal Declaration of Human Rights (Article 10) the International Covenant, on Civil and Political Rights (Article 14(3)(c)) the European Convention on Human Rights (Article 6) the American Convention on Human Rights (Article 8) and the African Charter on Human and Peoples' Rights (Article 7). When the guarantee is breached the legal system can respond with remedies ranging from dismissal of the charges, to the provision of specific remedial relief. The judicial appraisal to determine whether this right has been violated pertains invariably to a multifactor balancing test, which evaluates (inter alia) the length of the delay, the reason for the delay, the assertion of the right by the accused, and the resulting injustice, this four-pronged test being authoritative in the jurisprudence of the United States (*Barker v. Wingo, 407 U.S. 514 (1972)*). This is buttressed by historic maxims in law such as *audi alteram partem, nemo debet esse judex in propria causa, and delayed justice is denied justice,* the conjunction that defines the relationship inter se amongst procedural justice, justice free from bias, and time efficacy.

The Indian Judiciary is today dealing with the significant difficulty of a massive pendency of litigation, and it is among the heaviest loaded judicial systems across the globe. The Supreme Court and 25 High Courts and Subordinate Courts, as of 31 October 2024, had a total of more than 6 crore cases pending, out of which more than 43 lakh cases were languishing for more than a decade. This repeating delay has a direct effect on Article 21, which preserves the basic right to life and liberty of person, and has been judicially interpreted to include the right to a speedy trial (*Hussainara Khatoon v. State of Bihar (1979)*). The usual dependence on paper-based systems and in-person court appearances marked by handwritten cause lists, printed *Roznama,* and physical attendance has become insufficient for managing a nation with a populace of 1.4 billion. Consequently, the incorporation of technology has become a fundamental obligation to deal with pendency and promote accessibility. The technological interventions in India, in the context of the judiciary, are many and contemporary. The e-Courts Project, virtual hearings, Artificial Intelligence (AI)-based project management systems, etc., are now available and have immensely generated judicial speed through computerization of records, facilitating the remote adjudication and systematically monitoring procedural timelines.

"E-Courts" describes the Information and Communication Technology (ICT)-based structure under the e-Courts Mission Mode Project that consists of electronic filing, case-management

software, SMS/e-mail alerts, payment of court fees electronically, and a cloud-based National Judicial Data Grid (NJDG) showing near-real-time information on more than 26 crore cases and orders. "Virtual Hearings" are synchronous audio-video sessions held using the government's Vidyo platform or Jitsi between court complexes, jails, and lawyers' residences. From 23 March 2020 to 31 October 2024, Indian courts held a record 3.38 crore virtual hearings, the most anywhere in the world for any country's judiciary. The overarching concept of "Digital Justice" combines various techniques to enable cost-efficient, open, and citizen-centric conflict resolution while respecting due-process fundamentals like open court and equality of arms.

The empirical data reveals tremendous progress: *Phases I (2011-2015) and II (2015-2023)* of the e-Courts projects digitized 18,735 district and subordinate courts, set up 778 e-Seva Kendras, and set up 21 full virtual courts that disposed of 6.03 million traffic-challan cases and collected ₹649.81 crore in fines without any physical hearings. *Phase III (2023-2027)* has been sanctioned with a ₹7,210 crore budget, four times the preceding amount, and designates ₹53.57 crore for AI, Optical Character Recognition (OCR), and predictive analytics to predict delays and prioritize backlog cases. Yet experts warn that disparities in digital infrastructure, rural court bandwidth constrictions, lawyers' unfamiliarity with e-filing, and data privacy, cybersecurity, and digital divide concerns temper the positive.

Against this backdrop, the current research critically assesses to what extent technology improves judicial efficiency and minimizes delays, examines implementation issues, and canvases regulatory reforms required to make India's digital justice system inclusive, secure, and constitutionally compliant.

Historical evolution of technology in the indian judiciary

India's entry into judicial technology was triggered by a crisis of considerable magnitude. When the twenty-first century opened its doors, the Supreme Court had 30,000 cases pending before it, the 21 High Courts together had 3.4 million cases pending before them, and the subordinate judiciary had 24 million pending files. The root problems—handwritten registers, physical cause lists, manual serving of summons, crumbling court infrastructure, and a judge-population ratio of only 10 per million—were inherently structural.

In response, the "National Policy & Action Plan for ICT in Judiciary" (2005) suggested a Mission-Mode project under the National e-Governance Plan, and the e-Courts Integrated

Mission Mode Project was launched in 2007.*Phase I (2011-2015)* involved the computerization of 14,249 district and subordinate courts at a cost of ₹639 crore, the setting up of LAN in 13,683 courtrooms, the training of 14,309 judicial officers in open-source UBUNTU-CIS (Center for Internet Security) software, and the enabling of video conferencing between 347 jails and 493 court complexes. The utility value of real-time statistics led to the creation of the NJDG in 2015, a web-based Application Programming Interface (API)-pushed data store that presently has extensive, taluka-level information of 238.1 million cases and 230.2 million orders/judgments refreshed each 30 minutes.*Phase II (2015-2023)* scaled up the infrastructure to all 18,735 district and subordinate courts, networked 99.5% of court complexes via 10–100 Mbps WAN, provided desktop video conferencing facilities to 1,272 jails and 3,240 court buildings, and followed a cloud-ready "core-periphery" CIS that allowed every High Court to create local modules while feeding unified metadata to NJDG. This period also saw the inauguration of the globe's inaugural virtual court for traffic-challan dispensation at Delhi's Rouse Avenue in 2019; it has since disposed of 60.3 million small cases and realized ₹650 crore in fines without a single in-person hearing. India embraced the open-source philosophy, litigant-focused service charter, and the "digital-first" evidence guidelines to craft *Phase III (2023-2027)*, a ₹7,210 crore central-sector initiative to pursue paperless courts, OCR-based digitization of legacy records, AI-powered case clustering, and saturation of e-Seva Kendras in each court complex. Thus, within sixteen years, the Indian judiciary has transitioned from manual registers to an AI-enabled, cloud-native ecosystem that currently conducts 338 million virtual hearings annually, the highest figure recorded by any national judiciary worldwide.

The insights of innovative common-law jurisdictions hastened the process. The United Kingdom's £1.2 billion Reform Programme (2015-2023) proved that e-filing mandated by the court, cloud-based bundles of evidence, and remote hearings could decrease average civil disposition time by 36%. Singapore's Courts of Technology (2018) and the USA's CM/ECF (Case Management/Electronic Case Files, 1996) showed that open APIs, AI-driven scheduling, and live-streaming not only relieve docket crowding but also increase public confidence.

E-courts and digital case management systems

Launched as part of the National e-Governance Plan, the e-Courts Integrated Mission Mode Project is the largest court digitization initiative in the world. The project works towards

enhancing transparency, accessibility, and efficiency in the judicial system. It rests on an open-source Case Information System software platform, cloud storage, and the NJDG, which supplies near-real-time information regarding each case filed in the entire nation.

The major service elements are:***(a)***The***e-Filing 3.0***platformenables zero-contact commencement of civil and criminal cases by providing editable pleadings forms, e-signatures, online vakalatnama filing, and fee payment via SBI;***(b)Case-Tracking dashboards***allow litigants, advocates, and judges to view next-hearing dates, interim orders, or certified copies using a 16-digit Case Number Record (CNR) from any internet-accessible device;***(c)*** Furthermore, ***Judgment And Cause Lists*** have been digitalizedover 23.81 crore orders and judgments, which are OCR-searchable on NJDG and are auto-generated and distributed via SMS at 18:00 hrs daily on each working day;***(d)***To ensure inclusivity,***e-Sewa Kendras***have been established asphysical helpdesks situated in each court compound that offer assisted e-filing, biometric e-signing, and A4 scanning facilities to citizens who lack smartphones or the internet.

The impact of these digital reforms on case disposal has been substantial.The project has already shown very strong quantitative gains. In *Phase II*, 3.38 crore virtual hearings were held, the highest by any national judiciary. The Delhi, Maharashtra, and Karnataka High Courts, which have registered more than 95% e-filing penetration, have reported a 23% average reduction in first-hearing date assignment time (from 21 days to 16 days), a 31% reduction in disposal time for interlocutory applications, and a 42% reduction in litigant travel expenses, according to a 2024 survey of 3,200 advocates. At the district court level, the virtual traffic court, which was tested in Delhi in 2019, disposed of 6.03 crore challan cases and collected ₹649.81 crore worth of fines without any physical hearings, showcasing that a completely digital workflow can efficiently dispose of procedural backlogs.

The initiative offers several advantages for different stakeholders.***(a) Litigants*** benefit from24×7 case filing, automated scrutiny of pleadings which has reduced filing defects by 38%, mobile SMS notifications, and electronic payment of court fees;*(b)***Lawyers***can now access portfolio management tools that allow them to organize peer networks, save case files, get AI-recommended precedents, and book cloud depositions;and ***(c)***For the***Judiciary***,the system provides powerful analytical tools such as heat maps of pendency by statute, AI-powered clustering of connected cases, and intelligent scheduling that optimizes daily board length.

Despite these advancements, certain challenges and limitations persist. ***(a) Infrastructure gaps*** remain a significant obstacle, currently, only 67% of rural court complexes have fiber connectivity. The regular power cuts in places like Bihar, Odisha, and the Northeast require the utilization of generators, thus defeating the aim of getting a paperless setup; ***(b) Digital literacy*** is another issue, by the year 2023, only 49% of mofussil bar minders were aware of the uploading system for PDFs.Thus, considerable manpower had to be engaged in e-Sewa Kendras to maintain litigants; (***c) Cybersecurity concerns have also emerged***, NIC-CERT (National Informatics Centre– Computer Emergency Response Team) has recorded from Jan., 2022, to June, 2024, 312 phishing attempts, 27 ransomware alerts, and C.I.S. services were down for 18 hours, raising serious apprehensions regarding data integrity and degradation of continuing service; ***(d)*** Furthermore, ***accessibility*** challenges persist since the e-filing system 3.0 is still mainly English-driven, with local interfaces in Hindi, Marathi & Kannada, meaning its use is constrained in states such as Tamil Nadu, Telangana, and West Bengal, etc.

Notable case studies illustrate the real-world impact of these digital initiatives.The *Bombay High Court (Nagpur Bench),*after implementing mandatorye-filing system in August 2022 reduced the admission time for first appeals from 127 days to 82 days in a calendar year; automatically corrected defects were filed without hearing 92% of the time. The *Karnataka High Court* introduced theWhatsApp Bot, "Just Call,"which facilitates access tocause-list links, next-hearing reminders, and certified copies, benefiting 4.2 lakh unique litigants. The year 2024 showed a 28% reduction in footfalls.Similarly, the *Gujarat District Judiciary*in 2023, also tested AI-based "Smart Scheduling," using experience to forecast case length and automatically allocating 15-minute or 30-minute slots, thus enhancing the daily disposal of bail applications from 87 to 118 per court.

These micro-successes demonstrate how, with the strength of connectivity, training of users, and change management, e-Courts rollouts can really improve the process of delivering justice. But to universalize these advantages, targeted investment in rural broadband, multilingual interfaces, and cybersecurity protection is necessary.

Virtual hearings and video-conferencing in judicial processes

The Supreme Court's approval of video-conferencing in criminal remands can be traced back to the year 2000, as evident in the *State v. Navjot Sandhu case (2005)*. But a full legal framework for routine virtual hearings arrived only with the COVID-19 pandemic. On 6

April 2020, the Court invoked its constitutional epistolary jurisdiction to issue in*In Re: Guidelines for Court Functioning through Video Conferencing*, a suo motu writ that empowered every High Court to "adopt suitable… measures and to list proceedings before it through video conferencing."These directions were supported by Section 327 CrPC & Section 153-B CPC; the statutory requirement of trials to be held "in open court" was construed to embrace virtual 'open court' hearings, subject to live-streaming of public galleries. The Information Technology Act, 2000, s. 4 & 7 gives legal validity to electronic records and digital signatures in virtual hearings.In a matter of a few months, all 25 High Courts introduced Video-Conferencing Rules (VCRs), owing mostly to the Supreme Court's template, thus creating a standardized, national protocol for platforms like Cisco-Webex, Jitsi, and Vidyo.

The advantages of virtual court proceedings and digital transformation in the Indian judiciary are manifold.***(a) Cost & Time Saving,***from 23 March 2020 to 31 December 2023, virtual hearings were held by Indian courts to the tune of 3.38 crore, leading to an estimated saving of ₹8,900 crore in litigant travel and escort police costs; ***(b) De-congesting Jails,***the inauguration of simultaneous Video Conferencing(VC) links in 1,272 jails enabled the release of 13.7 lakh remand, bail, and parole orders without physical production, de-congesting the system by 11% in the first lockdown phase; ***(c) Access to Marginalized Communities,***the Bombay High Court Legal-Aid Committee indicates that 42% of women litigants in domestic-violence cases preferred the virtual mode so as not to be intimidated; 89% of scheduled-tribe appellants in Nilgiri district courts (Tamil Nadu) accessed Common Service Centers within 5 km from their hamlets; ***(d)Environmental Dividend,*** a2023 NIC study calculated that by shunning 2.1 billion km of road/rail travel, CO_2 emissions fell by 0.52 million tonnes, or the equivalent of planting 28 million trees.

Despite considerable progress, the online judicial system still experiences a variety of challenges and criticism. (a) The main issue concerns the digital divide, whereby only 3,477 of over 18,000 courtrooms are fitted with video conferencing cameras. The disparity always puts the rural practitioners at a disadvantage since they are hindered by restricted access to laptops and stable net access. (b) Moreover, technology also remains in the path towards the smooth operationalization of online courts. The statistics from NIC-CERT indicate 312 instances of bandwidth suppression, 27 ransomware alerts, and 18 hours of CIS downtime altogether in the period from 2022 to 2024, which accounted for 9,400 adjournments. (c) Integrity of due process has also been called into question; the Bar Council of India (2021)

observed that pixelated video will impede testing of demeanor evidence, and "blur background" use by witnesses will compromise cross-examination since they are able to read hidden instructions. (d) Further, cybersecurity and confidentiality remain top priorities. As compared to the United Kingdom's Cloud Video Platform (CVP) that is ISO-27001 certified and end-to-end encrypted, India is relying on Cisco-Webex servers that lie beyond its boundary lines, raising questions about sovereignty under personal data protection laws.

Certain landmark decisions have been instrumental in shaping the legal and constitutional paradigm for virtual courts in India. In Swapnil Tripathi v. Supreme Court of India (2018) 13 SCC 470, the Constitution Bench maintained that "open court" in Article 145(4) includes live-streaming and thereby laid the philosophical basis for virtual openness. Subsequently, the Supreme Court approved the Guidelines for Court Functioning through Video Conferencing (2020), permitting the use of video conferencing for hearings in all the constitutional and subordinate courts during the COVID-19 pandemic or the like crises.The Court also highlighted the importance of keeping detailed records of these online proceedings so as to maintain transparency and accessibility.Further, in***Suo Motu WP (Crl.) 2/2021 (SC),*** the Courtextended the VC regime post-COVID period, holding that “consensual VC mode can continue even after normalcy,” and made it clear that an objection by one side does not ipso facto render a VC trial invalid; courts need to balance health, cost, and convenience.

When compared globally, India’s virtual court infrastructure is steadily evolving but still trails behind jurisdictions like the United Kingdom and Singapore.The UK’s CVP and Singapore’s Technology Courts demand judicial bandwidth, encrypted endpoints, and digital court reporter processes that India is embracing in the ₹53.57 crore AI-VC part of e-Courts Phase-III. Yet, uniform service-level agreements, statutory recognition of VC evidence, and a sovereign Indian cloud are yet to be completed reforms.

2. Digital Justice, AI Integration, and Future Prospects

The concept of “digital justice” includes the strategic use of ICT, AI, and data-driven governance to provide transparent, economical, and citizen-centric legal services. In the Indian scenario, this project includesseveral advanced technologies and reforms.***(a) AI-driven tools*** such asOCR for computerization of old records, natural language processing (NLP) for enabling search for judgments, predictive analytics to calculate case lengths, and chatbots providing procedural advice round-the-clock;***(b) the e-Filing 3.0***platform enables contactless case filing, digital vakalatnamas, online payment of court charges, and auto-examination of

pleadings, which has led to a 38% decrease in defects;***(c) Automated Case Management***now employ intelligent scheduling engines to manage daily board lengths; SUPACE (Supreme Court Portal for Assistance in Court Efficiency) pulls out precedents and prepares summary notes for judges, thus reducing research time by 46%;***(d)***Furthermore,the National Legal Services Authority (NALSA)has introduced ***virtual legal-aid portals***and established e-Seva Kendras in eachdistrict court, providing marginalized litigants with free e-filing, video conferencing, and document scanning.

In measuring the impact of technology in hastening judicial processes, some vital successes come to light. Among the key successes of the e-Courts Mission between 2015 and 2023 has been the reduction of the backlog of cases.Unless the "digital divide" is bridged, digital justice can entrench current disparities.***(a)***The ***Rural–Urban Divide,***as only 67% of the 18,735 court complexes have fiber connectivity; in states like Bihar, Odisha, and the Northeast, recurrent power cuts require the use of paper processes.***(b) Socio-Economic barriers also persist,***as of 2023, only 49% of district-bar practitioners owned a laptop, and 32% of litigants interviewed by NALSA did not own a smartphone with a camera good enough for e-signing; ***(c) Language remains a further barrier,*** while e-Filing 3.0 is mostly English; vernacular user interfaces exist only for Hindi, Marathi, and Kannada, with Tamil, Telugu, and Bengali versions in beta release, limiting adoption in southern and eastern states. (***d) Gender disparityis equally concerning,***only 28% of registered users of e-filing are women; domestic violence survivors have to rely on Common Service Centres (CSCs) between 5 and 15 km away, undermining the anonymity advantage of virtual courts.

In examining the role of technology in accelerating judicial proceedings, several significant milestones are apparent. One of the primary success stories of the e-Courts Mission during 2015-2023 has been the substantial decline in pendency of cases. In these six years, 18,735 district and subordinate courts were computerized, enabling 3.38 crore digital hearings and disposing of 6.03 crore traffic-challan cases without having to conduct physical hearings. This effort has actually released an estimated 1.9 lakh judge-days for more urgent cases. The NJDG has improved transparency through the use of tamper-proof backlog statistics that allow citizens to track any case in real time and hence remove the information asymmetry that had camouflaged systemic inefficiencies. The application of AI has also sped up judicial proceedings: the Supreme Court's SUPACE portal prepares case summaries 46% quicker, and the Bombay High Court's intelligent scheduler has improved a day's board lengths and shortened admission-hearing periods from 127 to 82 days. Besides this, transparency has also

been massively improved by the live-streaming of constitutional benches and provision of YouTube archives, practically making courtrooms "open courts" for India's 1.4 billion people (*Swapnil Tripathi v. SC of India, 2018*).

Nonetheless, limitations persist. In spite of all this, a "digital ceiling" still exists. Complicated civil, matrimonial, and criminal cases still need oral evidence, assessment of demeanor, and physical production of documents. Such cases constitute 72% of the pending docket, but only 9% have used virtual conferencing for something other than procedural hearings. The infrastructure is still a major chokepoint, as only 67% of rural court complexes are fiber connected and 42% have weekly power cuts, making paper-based *Roznama* necessary once again. Human capital is also not without issues, since 49% of district-bar advocates did not have a smartphone in 2023, and just 28% of registered e-filing users are women litigants, raising problems of device access and patriarchal resistance. Cybersecurity practices remain predominantly reactive, with NIC-CERT reporting 312 cases of phishing and 18 hours of CIS downtime within two years, causing 9,400 adjournments, and posing questions regarding data sovereignty as Cisco-Webex servers are located outside India. Additionally, a hesitancy by judges to take evidence through virtual conferencing has further resulted in more adjournments in certain states, as "virtual" is unfortunately perceived to be synonymous with "casual."

The socio-legal implications of rapid digitization need careful examination. Stressing haste over fairness may undermine the legitimacy of processes. Although AI-supported scheduling has been effective in accelerating case resolution in fast-track courts, a 2024 empirical study discovered that almost 38% of decrees in credit card cases were set aside on appeal. This was primarily due to incorrect service or refusal of a fair hearing. When algorithmic proficiency has precedence over substantive justice, the Supreme Court's observation that "justice must not only be done but must manifestly be seen to be done" takes on greater importance. The problem is illustrated in cross-examinations performed through bandwidth-constrained video modalities that tend to warp micro-expressions and make full-fledged evidentiary examination difficult (In Re: Guidelines for Court Functioning through Video Conferencing, (2020) 19 SCC 435).What will follow is that technology should be perceived as a facilitator of judicial reasoning rather than a substitute for judicial reasoning, the rationale for which continues to be dependent on the moral sphere of functioning of human beings, where the equations continue to be human order, which is based on fair access and fair adversarial roles.

Looking ahead, the future prospects of digital justice in India are promising yet complex.***Algorithms***, having been trained on 23 crore NJDG records, now predict possible delay points, chances of adjournments, and bench duration. This function enables registries to automatically reallocate court time, decreasing listing gaps by as much as 23%. The SUPACE platform of the Supreme Court uses natural language processing to summarize pleadings and provide precedents, automatically decreasing judge research time by 46%. Meanwhile, Supreme Court Vidhik Anuvaad Software (SUVAS) renders judgments in 11 local languages, facilitating real-time democratization of access. Pilot experiments with outcome analytics, which give advice on statistical success rates in front of particular benches, have already begun in the Bombay and Delhi High Courts, although these analytics are not yet binding to maintain judicial discretion.The next phase envisions***Integrated Digital Platforms,*** the vision is to develop an all-encompassing "one-stop" portal through which citizens can e-file, pay court fees, follow cause lists, obtain translated papers, and participate in virtual hearings without multiple authentications. In the NJDG (2025) proposal, the interoperability of the Case Information System (CIS) 3.0, virtual court Vidyo links, and NIC payment gateway is being envisaged in an integrated digital identity framework based on e-KYC. The interoperability standards issued by MeitY in 2024 give primacy to an API-first architecture, which is intended to enable safe interoperability with state governments, legal-aid clinics, and private legal-tech start-ups.

The ***"smart courtrooms***" idea, displayed during Vimarsh 2023, visualizes completely automated hearings for traffic violations, cheque bouncing, and civic fines. An OCR scanner reads the challan, AI allocates the penal provision, an NLP chatbot captures the accused's plea, and a payment receipt gets blockchain-stamped within 10 minutes. The initial zero-human-judge bench is planned for a pilot launch at the Ahmedabad City Civil & Sessions Court in late 2025.The e-Committee Vision Document visualizes a future scenario where AI becomes the focal point of writing judgments, producing draft orders that could be finalized or adopted by judges while having human oversight for accountability leveraging the efficiency of AI. However, several critical challenges prevail. Ethical concerns are of most importance, with growing dependence on algorithmic bias fueling already prevailing inequalities, like the Overrepresentation bail denial to vulnerable groups, without adequate efforts to avoid such biases or add explainability capability. Mistranslation risk, as seen from the failure of SUVAS initially to translate "leave granted" as "holiday approved," highlights

the need for specialized domain corpora and post-editing by law-trained translators. Inadequacy of comprehensive regulatory frameworks is a grim challenge, as India currently lacks statutory provisions on AI evidence, accountability for predictive mistakes, or litigants' right to opt-out. The 2025 Kerala High Court's AI Policy, India's pioneer one, requires disclosure to affected parties, human screening of drafts, and regular audits, but these are only voluntary outside Kerala. Lastly, infrastructure inequality would lead to the creation of "elite courts" unless implementation of software is supplemented with rural connectivity upgrades, reliable electricity, and affordable technology.

3. Conclusion

Despite advancements, there are some critical challenges. Most important among these are ethical issues, regarding algorithmic bias, which can exacerbate ingrained inequalities, such as the routine denial of bail to minority communities, unless some measures are taken to reduce bias in training data and include explainability functionality. The threat of mistranslation, as the initial mistranslation by SUVAS of "leave granted" to "holiday approved," indicates the absolute need for specialized corpora and legal training of the post-editing linguists. The lack of regulatory guidelines is a major stumbling block, since there are no statutory provisions in India presently on AI evidence, predictive inaccuracy liability, or litigant opt-out rights. The 2025 Kerala High Court's AI Policy, an innovative move in India, mandates disclosure to parties, human checking of drafts, and periodic audits, although the above provisions are advisory for places outside Kerala. Finally, infrastructure differences risk transforming smart courts into "elite courts" if the rollout of software is not supplemented with rural fiber, stable power, and low-cost devices.AI and machine learning will continue to play a central role; however, their usage must also ensure human oversight, transparency, and accountability. Technology is not a substitute for justice, but a spur to its desirable promptness and operation. With equality of access, sound regulation, and ethical innovation, India's digital courts can be a model of reconciled promptness and justice, efficiency and equity, modernisation and the everlasting human values of justice.

Recommendations are:

(a) **Hard infrastructure:** Increase fiber-optic connectivity under Bharat Net Phase-III and set up solar-plus-battery microgrids in court campuses with limited power to provide 99.9% uptime.

(b) **Human infrastructure:** Make digital continuing education for judicial officers and advocates compulsory; mimic Kerala's "e-Court Fellow" program, where each judge is assigned a trained law-clerk intern.

(c) **Legal framework:** Implement a Court Technology Standards Act to have service-level agreements for bandwidth, encryption, and audit trails; legally acknowledge blockchain-timestamped evidence; and enact video conferencing evidence rules in the Bharatiya Sakshya Adhiniyam.

(d) **Cybersecurity:** Move from foreign proprietary platforms to a sovereign, NIC-hosted cloud certified under ISO-27001; mandate quarterly penetration testing and create a Judicial CERT with a sufficient budget annually.

(e) **Inclusion:** Localize e-filing portals in all 22 Eighth-Schedule languages; provide funding for mobile e-Seva vans to tribal and remote areas; enter zero-rating arrangements with telecom operators so that court sites don't eat up data, thus delivering on the constitutional promise of efficient and equal justice for all Indians.

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