
TECHNOLOGY IN INDIAN COURTS AND SPEEDY JUSTICE: AN ANALYSIS

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ABSTRACT

The prolonged delay in the delivery of justice constitutes one of the most persistent and debilitating crises confronting the Indian legal system. With a huge backlog of cases, India stands at a critical juncture where technological intervention is no longer an option but an institutional administrative requirement. This paper examines the deployment of information and communication technology in accelerating judicial processes in India, with particular focus on mechanisms including the e-Courts Mission Mode Project, the National Judicial Data Grid, Crime and Criminal Tracking Network and Systems, NCRB, Indian cybercrime Coordination Centre, National Automated Fingerprint Identification System, e-Forensics, Inter-Operable Criminal Justice System (ICJS) etc.

Drawing on comparative jurisprudence and institutional practices from Singapore, Canada, the United Kingdom, Chile, and Estonia, and at the international level UNCITRAL's Technical Notes on Online Dispute Resolution (2016), the UNSDG 16.3 mandating equal access to justice, and OECD frameworks on people-centric justice systems, the paper evaluates global models of e-litigation, Online Dispute Resolution (ODR), and digital case management systems as instructive archetypes for Indian judicial reform.

This paper identifies four significant research gaps: the absence of empirical outcome-based studies on the effectiveness of e-courts in Indian subordinate courts; the inadequacy of a comprehensive data governance and cybersecurity framework governing judicial data; the unexamined impact of the digital divide on procedural fairness; and the lack of a unified statutory framework for virtual court proceedings. The paper concludes with certain recommendations designed to bridge these gaps and place India at the front of technologically driven justice delivery.

Keywords: e-Courts, NJDG, Online Dispute Resolution, Access to Justice, Technology and Law, Article 21.

1. Introduction

The ideal of *Nyaya niti*, referring to the administration of justice as a sacred function of the state, finds its modern constitutional expression in Articles 14¹, 21², and 39A³ of the Constitution of India, which collectively guarantees equality before the law, protection of life and personal liberty, and free legal aid respectively. Despite these constitutional aspirations, a disheartening data comes from the National Judicial Data Grid (hereinafter referred to as NJDG), which shows the total number of pending criminal cases across all courts in India as 3,76,20,087, out of which 2,66,25 156 cases, which makes for roughly 70.71% of total cases are more than 1 year old⁴. This figure that has led scholars to describe access to justice in India as fundamentally limited for the economically disadvantaged sections of society.⁵ Justice delayed, as the maxim goes, is justice denied and in the Indian context, delay has become the defining characteristic of the legal experience for millions of ordinary litigants.

Against this backdrop, the use of technology in justice delivery, has acquired both urgency and constitutional significance. Beginning with the formation of an e-Committee by the Supreme Court of India in 2004 and culminating in the ambitious e-Courts Phase III programme approved in 2023, the Indian judiciary has progressively endorsed ICT as a vehicle for institutional reform. The COVID-19 pandemic served as a watershed moment where the courts that had been conventionally reluctant to technology were compelled to transition to virtual hearings, electronic filing, and remote testimony as a matter of institutional survival⁶.

This paper is aimed at addressing the concern that while the technological infrastructure of Indian courts has expanded considerably, the institutional and legislative frameworks governing this transformation remain nascent and fragmented. Following this introduction in part I, Part II surveys the constitutional and statutory legal framework governing the use of technology in Indian courts. Part III examines the principal mechanisms deployed for swift justice delivery such as India's e-Courts project. Part IV undertakes a comparative analysis of technology-driven justice delivery in select jurisdictions, with a focus on non-AI technological

¹ The Constitution of India, 1950 art.14.

² *Id.*, art.21.

³ *Id.*, art.39-A.

⁴ Ministry of Electronics & Information Technology, National Judicial Data Grid, https://njdg.e-Courts.gov.in/njdg_v3/, (last visited June 16, 2026).

⁵ Marc S Galanter and Jayanth K Krishnan, *Bread for the Poor: Access to Justice and the Rights of the Needy in India* 55 Hastings LJ 789, 802 (2004).

⁶ Khaja Moinuddin, *Digital Justice in India: A Study on Virtual Courts, Artificial Intelligence and Courts*, 13(11) IJCR (2025).

tools. Part V examines the international normative architecture on ODR and digital justice. Part VI identifies research gaps through a critical review of leading legal scholarship and proposes legislative and institutional reforms. The paper concludes with a synthesis and a forward-looking vision for India's digital judiciary.

2. Constitutional, Statutory and Institutional Framework

2.1. The Constitutional Imperative

The right to speedy trial, is unenumerated in the Constitution of India, 1950 (hereinafter referred to as The Constitution), which has been read into Article 21⁷ by the Supreme Court in a series of landmark pronouncements. In *Hussainara Khatoon v. State of Bihar*⁸, the Supreme Court held that the right to a speedy trial is an integral and essential part of the fundamental right to life and liberty⁹. This right was further elaborated in *Abdul Rehman Antulay v. R.S. Nayak*, where the Court laid down 11 guidelines for determining whether delay in the conclusion of trial amounts to a violation of Article 21¹⁰. The constitutional grounding of speedy justice creates an affirmative obligation on the state to deploy all available resources, including technological tools for the expeditious justice delivery.

Article 39A of the constitution¹¹ directs the state to ensure that the operation of the legal system promotes justice on a basis of equal opportunity and to provide free legal aid. When interpreted conjunctively with Article 21, it is recognised that the mandate is not merely formal access to courts but substantive and effective access by removing geographical, financial, and logistical barriers.

2.2 Statutory Instruments

The legal framework operational in the use of technology in the justice system is made up of several statutes.

The legislation that offers the basic legislative framework of electronic governance is the

⁷ *Supra*, note 2.

⁸ *Hussainara Khatoon v State of Bihar* (1979) 3 SCC 544.

⁹ *Id.*

¹⁰ *Abdul Rehman Antulay v. R.S. Nayak* (1992) 1 SCC 225.

¹¹ *Supra*, note 3.

Information Technology Act, 2000. The admissibility of electronic records¹² as evidence is governed by section 63 of the Bharatiya Sakshya Adhiniyam, 2023, which requires a certificate that the electronic record is of the correct integrity. The BSA, 2023 has significantly updated the evidentiary framework by broadening the meaning of the word document to the electronic and digital records. Apart from that the BNSS, 2023 provides for e-FIR¹³ which was not available under corresponding section of 'the 1973 Code¹⁴'. The BNSS, 2023 also provides for the recognition of electronic service¹⁵. The Code of Civil Procedure, 1908, and especially Order V (service of summons)¹⁶, and the Commercial Courts Act, 2015¹⁷, have been modified to allow service of process electronically, substantially decreasing the procedural delays that traditionally accompanied physical service. Electronic arbitration and Online Dispute Resolution¹⁸ has a statutory foundation through the Arbitration and Conciliation Act, 1996, which is supplemented by the provisions on electronic communications contained in the IT Act, 2000 in a number of commercial issues. The Legal Services Authorities Act, 1987 has been gradually updated to permit e-Lok Adalats which deploy digital platforms that are utilized to allow out-of-court settlement of disputes and thus, prevent cases being taken to the formal court system. The e-Lok Adalat framework operates administratively through NALSA (National Legal Services Authority) schemes and circulars under the authority granted by section 4(b) (functions of NALSA¹⁹) and section 19 (cognizance of Lok Adalats²⁰). Most notably, the three new criminal procedure codes namely, the Bharatiya Nagarik Suraksha Sanhita, 2023 (BNSS); the Bharatiya Nyaya Sanhita, 2023 (BNS); and the BSA 2023 expressly acknowledge and require application of technology in criminal proceedings such as the electronic service under the BNSS, 2023²¹ also allows the trial proceedings to be held by video conferencing under special conditions that are stipulated as a result of which the judicial direction and administrative circulars were the only remaining bases of the practice. III. Indian Justice Delivery Technology Mechanisms.

¹² Bharatiya Sakshya Adhiniyam, 2023, s 63, No. 47, Acts of Parliament, 2023(India).

¹³ Bharatiya Nagarik Suraksha Sanhita, 2023, s 173(1), No. 46, Acts of Parliament, 2023(India).

¹⁴ The Code of Criminal Procedure, s 154, No. 2, Acts of Parliament, 1974(India).

¹⁵ *Supra*, note 13, s. 64.

¹⁶ The Code of Civil Procedure, 1908, O. V, Act No. 5 of 1908(India).

¹⁷ The Commercial Courts Act, 2015, s 16, No. 4, Acts of Parliament, 2016(India).

¹⁸ The Arbitration and Conciliation Act, 1996, s7(4)(b), No. 26, Acts of Parliament, 1996(India).

¹⁹ The Legal Services Authorities Act, 1987, s 4(b), No. 4, Acts of Parliament, 2016(India).

²⁰ *Id.*, s. 19.

²¹ *Supra*, note 13, s. 530.

2.3. Institutional Framework

2.3.1. The e-Courts Mission Mode Project:

The project is the foundation of judicial technology architecture in India. It has been implemented in the following three phases under the joint supervision of the Department of Justice, the Ministry of Law and Justice, and the e-Committee of the Supreme Court of India as per the conceptualisation of the National Policy and Action Plan on Implementation of Information and Communication Technology in the Indian Judiciary (2005)²².

Phase I (2010–2015) achieved the computerisation of 14,249 district and subordinate courts at a cost of ₹639 crores, installing hardware infrastructure and deploying the Case Information System (CIS) software, which enabled digital management of cause lists, case status information, and judgment databases.

Phase II (2015–2023) at a cost of Rs.1,670 crores, extended the project by prioritising and focusing on a citizen-centric service delivery mechanism. This phase saw the deployment of e-filing systems, the establishment of 500 eSewa Kendras across 26 High Court jurisdictions, the creation of a Mobile e-Courts application for litigants and advocates, the installation of Judicial Service Centres, and the creation of video conferencing linkages between 3,240 court complexes and 1,272 jails across the country²³. As of October 31, 2024, district and subordinate courts had heard 2,48,21,789 cases through video conferencing, with the High Courts having heard a further 90,21,629 cases, amounting to a cumulative total of 3.38 crore video-conferenced hearings²⁴.

Phase III (2023–ongoing), with a financial outlay of Rs. 7,210 crores, envisions a significant leap from mere digitalisation to comprehensive digital justice. Its objectives include the creation of a unified technology platform for the judiciary, paperless courts through digitisation of all legacy records, universalisation of e-filing and e-payments, the institution of e-Sewa Kendras at every court complex, and data-based decision-making tools for judges and court

²²e-Committee, Supreme Court of India, E-Courts Mission Mode Project, <https://ecommitteesci.gov.in/project/brief-overview-of-e-courts-project/>, (last visited, 16 June 2026)

²³ Department of Justice, Government of India, *e-Courts Mission Mode Project* (Dec. 17, 2024), <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2085127®=3&lang=2>, (last visited, 13 June, 2026)

²⁴ *Id.*

registries²⁵. Phase III also envisages the establishment of dedicated Technology Offices at High Courts responsible for configuration, adoption, and continuous improvement of digital infrastructure.

2.3.2. The National Judicial Data Grid (NJDG)

The National Judicial Data Grid is perhaps India's most significant contribution to global judicial innovation. It constitutes a comprehensive, publicly accessible digital repository of data relating to cases filed, pending, and disposed of by courts at every level of the judicial hierarchy starting from district courts to that of the Supreme Court of India²⁶. The data is updated in near real-time by connected courts, enabling date-wise, and geography-wise analysis of judicial pendency. The NJDG employs "elastic search technology" which enables efficient case management and monitoring²⁷.

The NJDG has successfully been able to achieve three important institutional outcomes. First, it has generated transparency and accountability by placing judicial performance data in the public domain. Second, it has enabled data-driven policymaking by the government and higher judiciary, facilitating the identification of institutional bottlenecks. Third, and with most global significance, it has been acknowledged under the Government of India's Ease of Doing Business initiative, with the World Bank recognising the NJDG in its Ease of Doing Business reports for its role in generating case management reports and facilitating the enforcement of contracts²⁸.

2.3.3. Virtual Courts

Virtual courts portray a significant innovation in the Indian judicial landscape. As of 2022, virtual courts had been operationalised in 21 States and Union Territories, functioning under a judge whose jurisdiction is not geographically bounded and who may operate round-the-clock. These courts have been particularly effective in the disposal of traffic challan cases. As of December 2024, virtual courts had heard over 6 crore such cases and realised Rs. 649.1 crores

²⁵ *Id.*,

²⁶ National Informatics Centre, Government of India, *National Judicial Data Grid* <https://njdg.e-Courts.gov.in> (last visited, 13 June, 2026)

²⁷ e-Committee, Supreme Court of India, *National Judicial Data Grid* <<https://ecommitteesci.gov.in>> (last visited, 3 June, 2026).

²⁸ D Ravindra Satish Babu: *e-Justice in India: A Conceptual Framework*, 71(2), Indian J. Pub. Admin. 328 (2025), <https://journals.sagepub.com/doi/10.1177/00195561251339041> (last visited, 10 June 2026)

in fines²⁹. The virtual court proceedings in India are anchored by High Court Video Conferencing Rules framed pursuant to directions of the SC, ensuring procedural regularity.

The Supreme Court itself, in *Swapnil Tripathi v. Supreme Court of India* (2018)³⁰, recognised the principle of open court proceedings and mandated live-streaming of constitution bench hearings, thereby deploying technology in the service of judicial transparency and public accountability. This jurisprudence has had a cascading effect, with the operationalisation of live-streaming bench proceedings by the High Courts of Gujarat, Gauhati, Orissa, Karnataka, Jharkhand, Patna, Madhya Pradesh, Uttarakhand, Calcutta, and the Supreme Court³¹.

2.3.4. Electronic Filing (e-Filing) and e-Payments

The electronic filing system, that gradually expanded to all the High Courts and district courts, allows litigants to submit pleadings, applications, and vakalatnamas entirely online. Key features include e-signing of documents, online oath-recording through video, e-payment of court fees and fines, multilingual filing support, and portfolio management of cases. The e-filing system has materially reduced the time and cost of document submission, mitigated the risk of physical loss of records, and eliminated the need for physical presence at the filing counter.

2.3.5. e-Lok Adalats

The National Legal Services Authority has worked out the *e-Lok Adalats*, which conducts pre-litigation and the Lok Adalat proceedings through the means of video conferencing and digital platforms. These mechanisms are grounded in the Legal Services Authorities Act of 1987 and complement the formal judicial system by providing an expeditious and cost-effective avenue for the settlement of disputes.³²

²⁹ Press Information Bureau, Government of India, Ministry of Law and Justice 'EXISTING VIRTUAL COURTS IN THE COUNTRY' (Dec. 5, 2024) <https://www.pib.gov.in/Pressreleaseshare.aspx?PRID=2081106®=3&lang=2> (last visited, 5 June, 2026).

³⁰ *Swapnil Tripathi v. Supreme Court of India* (2018)10 SCC 628

³¹ Press Information Bureau, Government of India, Ministry of Law and Justice 'Live Streaming of Court Proceedings' <https://www.pib.gov.in/Pressreleaseshare.aspx?PRID=1809626®=3&lang=2>, (last visited, 15 June, 2026).

³² National Legal Services Authority, Department of Justice, Ministry of Law and Justice, Government of India, 'Lok Adalats', <https://nalsa.gov.in/lok-adalats/>, (last visited, 15 June, 2026).

2.3.6. Crime and Criminal Tracking Network and Systems (CCTNS)

Crime and Criminal Tracking Network and Systems (CCTNS) is the base technology platform of the whole Indian criminal justice system. CCTNS project was initiated in 2009 and has a total approved outlay of Rs. 2000 crore, and intended to connect all the police stations on a unified application software with the intention of investigation, data analytics, learning of policy and offering of services to the citizens such as reporting and tracing of complaints. Citizens are enabled to file FIRs and monitor complaints via CCTNS citizen portal. It functions on a Core Application Software (CAS) in each of the police stations where a digital capture of all details of an FIR and investigation is done. It falls under Ministry of Home Affairs (MHA) and it is implemented by NCRB and NIC is the technology partner³³. The constitutional and legal importance of CCTNS is that it will help in averting the infringement of the right of the accused against arbitrary detention. In the case of *Arnesh Kumar v. State of Bihar*³⁴, the SC has determined that the automatic registration of offences and subsequent arrest without use of mind is a breach of Article 21. By granting access to the entire criminal and investigative history of a case to the investigating officers and supervisory authorities, CCTNS offers the informational structure needed by the Court to apply mind as mandated by the Court in *Arnesh Kumar*³⁵, and thus enhances not only the efficiency of prosecutors but also the safeguarding of individual freedom.

2.3.7. Indian Cybercrime Coordination Centre

Indian Cybercrime Coordination Centre (I4C) The Indian Cybercrime Coordination Centre (I4C) was established by the Ministry of Home Affairs (MHA) in New Delhi to offer a framework and ecosystem in which law enforcement agencies can address cybercrime in a unified and holistic manner. I4C is the node in dealing with cybercrime in India. It consists of seven units, the National Cybercrime Threat Analytics Unit (TAU), the National Cybercrime Reporting Portal, the Platform for Joint Cybercrime Investigation Team, the National Cybercrime Forensic Laboratory Ecosystem, the National Cybercrime Training Centre (NCTC), the Cybercrime Ecosystem Management Unit, and the National Cyber Crime Research and Innovation Centre. I4C has a Citizen Financial Cyber Fraud Reporting and

³³Ministry of Home Affairs, 'Inter-operable Criminal Justice System (ICJS)', <https://www.mha.gov.in/en/commoncontent/inter-operable-criminal-justice-system-icjs>, (last visited, 13 June, 2026).

³⁴*Arnesh Kumar v. State of Bihar* (2014) 8 SCC 273.

³⁵*Id.*

Management System, which was introduced in 2021 and saved more than Rs. Out of over 13.36 lakh complaints, 4,386 crore is received with a toll-free Helpline number 1930 to report any financial fraud³⁶.

2.3.8. Inter-Operable Criminal Justice System (ICJS)

To make the justice delivery system more effective an Inter-Operable Criminal Justice System (ICJS) has been created, which integrates main pillars of criminal justice in the form of Police (CCTNS), Courts (e-Courts), Jails (e-Prisons), Forensic Lab (e-Forensic) Prosecution (e-Prosecution). It can be achieved by using various databases collectively and with single data of entry in the system only once (ONE DATA ONCE ENTRY) it would discourage foot dragging at all level. The ICJS Project would also provide for changes in the technology & processes required across this criminal justice delivery system to implement the Criminal Procedure (Identification) Act.³⁷ The constitutional mandate of ICJS is authoritatively expressed by the directions of the Supreme Court in *In Re: Expeditious Trial of Cases*³⁸ under Section 138 of Negotiable Instruments Act 1881, where the Court directed systemic reforms to accelerate the pendency of cases by, among other things, increasing information exchange between judicial The ICJS actualises these instructions by developing the technical framework of the exact inter-agency coordination.

2.3.9. E-Sakshya Application: Digitisation of Evidence Collection and Transmission:

The E-Sakshya application is an application designed by the National Informatics Centre (NIC) under the auspices of the Ministry of Home Affairs. It is a dedicated digital resource of recording, preserving, and safe transfer of the evidence found at the crime scene. The application also allows Investigating Officers to post photographic and video records of crime scenes, post-mortem items and seized property directly to a centralised, tamper-evident cloud repository in real-time. This aids in reducing the possibility of loss, tampering or degradation of evidentiary material which has traditionally been a part of the physical possession of records

³⁶Ministry of Home Affairs, 'INCIDENTS OF DIGITAL ARREST' <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2114750®=3&lang=2>, (last visited, 15 June, 2026).

³⁷ Ministry of Home affairs, 'Inter-operable Criminal Justice System (ICJS)' <https://www.mha.gov.in/en/commoncontent/inter-operable-criminal-justice-system-icjs>, (last visited, 15 June, 2026).

³⁸ In Re: Expeditious Trial of Cases under Section 138 of Negotiable Instruments Act 1881 (2021) 14 SCC 395.

of this type³⁹. The legislative basis on the admissibility of such collected evidence is based on Section 63 of the Bharatiya Sakshya Adhiniyam 2023. In *State of Himachal Pradesh v. Jai Lal*⁴⁰, the Supreme Court noted that any delay in manufacturing physical evidence is a material cause of protracted criminal trials. The app significantly reduces the evidentiary bottlenecks that have defined the Indian criminal proceedings through the digitisation of evidentiary records at the point of collection and making them instantly available to the investigating officer, prosecution, and court through a secure digital chain of custody.

2.3.10. National Automated Fingerprint Identification System:

The National Automated Fingerprint Identification System (NAFIS) constitutes India's centralised biometric database for the automated matching and identification of criminal fingerprint records. NAFIS gives each arrested person a unique National Fingerprint Number (NFN), establishing a continuous, nationally searchable biometric identification record, accessible to law enforcement agencies in all States and Union Territories in real time. The role of NAFIS in the journey of the criminal justice proceedings can be proven at two levels. At the investigative phase, automated identification of latent fingerprints found at crime scenes against the NAFIS database facilitates quick identification of suspects that used to take weeks of manual matchups before being identified.⁴¹ According to NCRB, NAFIS has been able to perform fingerprint identification requests in seconds and this has played a significant role in shortening the length of investigation phase and therefore the period of filing of the charge sheet under Section 193 of the BNSS. During the trial phase, NAFIS-created identification records are electronic records that are admissible under Section 63 of the BSA 2023, and act as forensic corroboration of the prosecution case, since it is not reliant on oral testimony that is often slowed down by the inability of witnesses to appear.

2.3.11. Facial Recognition Technology in Law Enforcement: Capabilities, Deployment and Constitutional Constraints:

Facial Recognition Technology implementation is one of the most debatable technological interventions in the criminal justice sphere regarding the constitution. The National Crime

³⁹ Shashi Kant Sharma, National Informatics Centre, 'eSakshya' (2025) <<https://informatics.nic.in/files/websites/april-2025/esakshya.php>> (last visited, 15 June, 2026).

⁴⁰ *Himachal Pradesh v. Jai Lal* (1999) 7 SCC 280

⁴¹ State Crime Records Bureau, Madhya Pradesh Police, 'NAFIS (National Automated Fingerprint Identification System)' <https://scr.b.mppolice.gov.in/nafis.php>, (last visited, 10 June, 2026).

Records Bureau has created the Automated Facial Recognition System (AFRS) which is a module connected with the CCTNS and NAFIS infrastructure which is capable of the automated matching of facial image of captured CCTV footage, crime scene photographs or field camera footage to a national criminal record and watch-listed database. FRT plays an important role in the mission of investigation and experimentation because it allows identifying unknown suspects and missing individuals in the shortest possible time, which minimizes the time spent on the investigative process.⁴²

3. Comparative Global Perspectives: Technology in Justice Delivery

3.1. Singapore: The Electronic Filing System and eLitigation

Singapore presents the most extensive model of end-to-end electronic litigation among the common law jurisdictions. In 2000, the Singapore Judiciary implemented the world's first Electronic Filing System (EFS) for civil litigation which gave rise to a transformational shift from paper-based to paperless proceedings.⁴³ The impact was immediate and dramatic wherein it was observed that a backlog of 2,000 cases pending trial in the High Court (with trial dates available only three years out) was reduced by 92% within three years of EFS implementation⁴⁴.

In 2013, the EFS was upgraded to the more sophisticated eLitigation platform, a web-based system employing content management and dynamic electronic form technology that provides law firms and court users with an integrated platform for filing documents, managing case files, scheduling hearings, and receiving automated deadline alerts throughout the entire litigation lifecycle⁴⁵. The Singapore State Courts have further developed the Community Justice and Tribunals System (CJTS), an online platform through which small claims, employment, and community disputes are filed and managed, with an in-built e-negotiation tool enabling parties to reach settlement and obtain enforceable court orders without physical attendance⁴⁶. Over

⁴² Huma Siddiqui, 'National Automated Facial Recognition of NCRB: Accuracy a Cause of Concern' (*Financial Express*, 2019), <https://www.financialexpress.com/business/defence-national-automated-facial-recognition-of-ncrb-accuracy-a-cause-of-concern-1746132/>, (last visited, 15 June, 2026).

⁴³ CrimsonLogic, 'Case Study: CrimsonLogic eLitigation', <https://www.crimsonlogic.com>, (last visited, 15 June, 2026).

⁴⁴ CrimsonLogic (n 12); Chan Sek Keong CJ, 'Overcoming Backlogs' (Speech delivered at the 12th Conference of Chief Justices of Asia and the Pacific, Singapore, 2010).

⁴⁵ Singapore Judiciary, *eLitigation* <<https://www.judiciary.gov.sg>> accessed 1 April 2025; 'Digital War Rooms in Hearings, Trials and Beyond' [2016] Singapore Law Gazette (October).

⁴⁶ Toh Yung Cheong (Chief Information Officer, Singapore State Courts), quoted in 'Inside Singapore's Move to Virtual Court Hearings' (*GovInsider*, 2020), <https://govinsider.asia>, (last visited, 12 June, 2026).

30,000 cases had been filed through this online platform since its 2017 launch.

The Singapore system is an instructive model for the development of Indian Judiciary in several aspects. Firstly, it demonstrates the significance of a multi-phased and cyclic approach to digitalisation. This is done by beginning with basic electronic filing before advancing to integrated case management. Secondly, it showcases the critical nature of structured change management. The Singapore Judiciary has implemented mandatory training, awareness seminars, e-guides, and 24*7 helpdesk support to ensure the adoption by legal professionals. Thirdly, the Singapore Courts' has deployed a "justice scorecard" which is an automated performance measurement tool that monitors the wait times, appeal rates, and mediation success rates. This tool demonstrates how data analytics can be deployed not merely for transparency but for continuous institutional improvement⁴⁷.

3.2. British Columbia, Canada: The Civil Resolution Tribunal (CRT)

Canada's Civil Resolution Tribunal was established by the Civil Resolution Tribunal Act (British Columbia) which came into effect on the March 15, 2013. It began hearing cases in July 2016 and is now popularly regarded as the world's first fully public-justice-integrated ODR system⁴⁸. The CRT provides accessible, affordable, and largely self-represented forum for the resolution of property disputes. Additionally, it also hears small claims up to CAD \$5,000, motor vehicle injury claims, and other specified matters.

The CRT's process architecture consists of the Solution Explorer, which is an AI-free, rule-based interactive information portal, followed by facilitated negotiation, mediation, and adjudication stages. It demonstrates a very nuanced and human-centred approach to technology-assisted dispute resolution. CRT proceedings are conducted asynchronously through its online platform, with the option of telephone or video conference hearings where necessary. Critically, the CRT operates on an "access-first" philosophy. It provides paper-based alternatives for those who are unable to use technology, and its prototype was tested primarily with the most marginalised users, including non-English speakers, new immigrants, and persons with disabilities⁴⁹. Research studies indicate that approximately 45% of CRT users

⁴⁷*Supra*, note 46

⁴⁸Shannon Salter, 'Online Dispute Resolution and Justice System Integration: British Columbia's Civil Resolution Tribunal' (2017) 34(1) Windsor YB Access to Justice 112.

⁴⁹HiiL, Case Study: BC Civil Resolution Tribunal, Justice Dashboard, <https://dashboard.hiil.org>, (last visited 1, June 2026).

access the platform outside traditional court hours, demonstrating its practical benefit for those who cannot take time off work⁵⁰.

The CRT's enforceable orders which carry the same force as judgments of the Supreme Court or Provincial Court of British Columbia under Sections 57 and 58 of the CRTA, address a critical weakness of conventional ADR: the lack of binding effect. For India, the CRT model suggests the legislative architecture necessary to create a binding, court-integrated ODR system for low-value civil disputes, a reform that could divert millions of cases from the formal court system.

3.3.England and Wales: Money Claim Online and the Online Civil Court Proposal:

England and Wales used Money Claim Online (MCOL), a government portal that allows citizens to enter monetary claims digitally, as early as the late 1990s. MCOL system deploys the use of the approach to functional simplification of a small claims procedure (which is already simplified) to the greatest extent possible in order to maximize digital accessibility has been identified by scholars as an example of how legislative change may facilitate technological innovation. This hybrid system will be a valuable example to India, in which any implementation of digital filing systems should be accompanied by procedural simplification. The 2015 report of the Online Dispute Resolution Advisory Group of the Civil Justice Council, under the chairmanship of Professor Richard Susskind, suggested a three-tier online civil court in England and Wales, which has led to the establishment of a substantial comparative jurisprudence in the principles of the design of online courts, such as the need to be accessible, proportionate, and the need to protect the procedural rights of litigants⁵¹.

3.4.Chile: Platform Conecta and Data-Driven Court Management.

Responding to the COVID-19 pandemic, the Chilean judiciary created Conecta, a digital platform that allowed citizens to communicate with a court via video call, chat, or WhatsApp, which combines various sources of data and lets courts respond to inquiries made by citizens and provide updates on their case statuses effectively. It successfully used the technical literacy

⁵⁰Darin Thompson, The Online Justice Experience in British Columbia, Soc'y for Computers and L. (2016); <https://www.scl.org/3784-the-online-justice-experience-in-british-columbia/> (last visited, 25 June, 2026)

⁵¹Civil Justice Council, Online Dispute Resolution Advisory Group, *Online Dispute Resolution for Low Value Civil Claims* (2015), (Richard Susskind Chair), <https://www.judiciary.uk/wp-content/uploads/2015/02/Online-Dispute-Resolution-Final-Web-Version1.pdf>. (last visited, 13 June, 2026)

barrier that usually hinders the implementation of purpose-specific court management tools by utilizing such popular communication tools as WhatsApp⁵². The Chilean model of last-mile judicial service delivery would be a good fit to study India where WhatsApp has over 500 million users.

4. International Normative Framework:

4.1. Technical Notes on Online Dispute Resolution (UNCITRAL, 2016):

The Technical Notes on Online Dispute Resolution were adopted by the United Nations Commission on International Trade Law in 2016. It is a ground-breaking normative text which, though non-binding and descriptive in nature, reflects the values of fairness, transparency, due process, and accountability as applied to ODR systems⁵³. The Technical Notes, later endorsed by the UN General Assembly in Resolution A/RES/71/138 of December 2016, are aimed at helping the States including developing countries and economies develop and utilize ODR⁵⁴.

The Technical Notes represent the most authoritative international recognition of ODR as a legitimate and desirable mode of dispute resolution. For India, they carry particular significance in providing a principled framework for the design of statutory ODR regulations. This is particularly notable since India has not yet formally adopted such a framework into its legislative architecture.

As Professor Ronald Brand of the University of Pittsburgh has argued, the failure of UNCITRAL Working Group III to deliver a binding international ODR framework due to irresolvable tensions between pre-dispute binding ODR agreements and the fundamental right of access to courts, has resulted in a landscape where national and regional initiatives have filled the normative vacuum⁵⁵. India's statutory ODR framework must therefore be designed with reference to these principles but must also address India-specific concerns of enforceability, language accessibility, and digital literacy.

⁵²'The Data Revolution in Justice' (2024) World Development (ScienceDirect), <https://www.sciencedirect.com>, (last visited, 13 June, 2026).

⁵³UNCITRAL, *Technical Notes on Online Dispute Resolution* (2016) UN Doc A/CN.9/WG.III/WP.147, <https://uncitral.un.org>, (last visited, 1 June, 2026).

⁵⁴UN General Assembly Resolution A/RES/71/138 (19 December 2016) 'Technical Notes on Online Dispute Resolution'.

⁵⁵Ronald A Brand: UNCITRAL, Access to Justice, and the Future of Online Dispute Resolution, 8 BCDR International Arbitration Review 87; University of Pittsburgh Legal Studies Research Paper No 2024-16 (2021).

4.2.UN Sustainable Development Goal 16.3

Sustainable Development Goal 16.3, to which India is a signatory, mandates the promotion of the rule of law at national and international levels and the assurance of equal access to justice for all. The SDG framework explicitly recognises that access to formal and informal justice mechanisms is a fundamental development outcome, linking it to various goals such as poverty reduction, gender equality, and sustainable economic growth. The deployment of technology in India's justice delivery system is therefore not merely a judicial management concern but a development obligation under international law.

4.3.OECD Frameworks on People-Centred Justice

The OECD's 2023 Recommendation on Access to Justice and People-Centred Justice Systems, and its 2024 ODR Framework is a well articulated and comprehensive vision for technology-enabled justice that prioritises user needs, equitable access, and institutional coherence. The OECD framework emphasises that the ODR mechanism be embedded in a broader justice ecosystem rather than having it treated as a standalone technological fix. This principle can be absorbed and made applicable in India as well, where the e-Courts project may be integrated with legal aid systems, paralegal services, and community outreach programmes⁵⁶.

5. Visible gaps and Recommendations

A systematic review of the leading legal scholarship on technology and justice delivery in India reveals four significant research gaps that demand legislative attention.

5.1.Absence of Empirical Outcome-Based Research

The overwhelming majority of existing legal scholarship on the e-Courts project is descriptive rather than evaluative. There is a conspicuous absence of rigorous, empirical studies measuring the actual impact of e-courts on disposal rates, access rates, and justice outcomes in subordinate courts, which handle the overwhelming majority of India's case load. This echoes a criticism raised more broadly in the European context where the scholars examining European court automation have noted that "the most important flaw of this information is that there is still not

⁵⁶OECD, *Online Dispute Resolution Framework*, OECD Policy Paper No 59 (OECD Publishing 2024); OECD, *Recommendation on Access to Justice and People-Centred Justice Systems* (OECD 2023).

any empirical evaluation as to the operational functionality of the applications reported"⁵⁷.

The Law Commission of India and the e-Committee of the Supreme Court therefore must work jointly commission longitudinal empirical studies measuring the impact of e-Courts Phases I, II, and III on case disposal rates, access to justice outcomes, and litigant satisfaction, with particular attention to subordinate courts in rural and semi-urban jurisdictions.

5.2.Inadequacy of Judicial Data Governance and Cybersecurity Framework:

The centralisation of vast quantities of sensitive judicial data on platforms such as the NJDG, while enhancing transparency and accountability, raises fundamental questions of data governance, privacy, and cybersecurity that the existing legal framework is ill-equipped to address. It is argued that "the potential for risks and harms from incomplete or biased datasets is known and documented," and the datafication of courts "can lead to an over-reliance on quantifiable aspects of the system, hinder the development of legal theory, and lead to the commercialisation of case data"⁵⁸.

India currently lacks a comprehensive statute governing the use of data generated by courts. This gap is all the more concerning given that the NJDG contains granular, personal, and in some instances sensitive information about litigants. The Digital Personal Data Protection Act, 2023, while providing a general framework for data protection, does not specifically address the unique data governance challenges of the judicial system. The Parliament may enact a dedicated Judicial Data Governance Act providing for: (i) classification of judicial data by sensitivity level; (ii) mandatory cybersecurity protocols for all courts connected to the NJDG; (iii) limitations on commercial use of court data; (iv) a right to erasure for parties in matters of personal sensitivity such as matrimonial, POCSO, and protection order proceedings; and (v) an independent Judicial Data Oversight Authority.

5.3.The Digital Divide and Procedural Fairness

Existing research including a report cited by the office of the Chief Justice of India has revealed that only 27% of trial courtrooms have a computer on the judge's dais and 10% lack the

⁵⁷Supra, note 52.

⁵⁸Dona Mathew, Technology-enabled Justice in Indian Courts: New Dilemmas and Way Forward, 10(1) , Journal of Dev. Pol'y and Prac. (SAGE), (2025), <https://journals.sagepub.com/doi/10.1177/24551333241262892>, (last visited, 31 June, 2026).

minimum internet access required for virtual functioning⁵⁹. A survey of advocates found that 90% were unaware of e-filing technology⁶⁰. According to the State of India's Digital Economy (SIDE) Report of 2024, nearly 48% of Indians do not access the internet, with the unconnected disproportionately comprising women, rural populations, persons with disabilities, the elderly, and children⁶¹.

The scholarly literature including Galanter and Krishnan's foundational work in the *Hastings Law Journal* and Cabral et al.'s study in the *Harvard Journal of Law and Technology* consistently emphasises that technology-driven justice reform has a documented tendency to reproduce and deepen pre-existing inequalities if it is not accompanied by deliberate digital inclusion programmes⁶². The risk in the Indian context is particularly acute where there is a mandatory e-filing system deployed without commensurate investment in e-Sewa Kendras, mobile-based access, and legal literacy effectively transfers the burden of technological inadequacy from the state to the most vulnerable litigants.

The central government should enact a Right to Justice Infrastructure Act mandating minimum technology infrastructure standards for every court complex, with a time-bound programme for universal broadband connectivity through the BharatNet project. The eSewa Kendras should be expanded at a ratio of one kendra per 10,000 rural residents. In the immediate term, courts should leverage the Common Service Centres (CSCs) network to extend e-filing and court fee payment services to the gram panchayat level.

5.4. Absence of a Unified Statutory Framework for Virtual Courts

A critical legislative gap identified in the current literature is the absence of a comprehensive, standalone statute governing virtual court proceedings in India. The legal authority for video conferencing hearings currently rests on a combination of High Court Video Conferencing Rules (which differ across jurisdictions), administrative circulars, and judicially inferred power

⁵⁹ Ayush Singh: *Justice or Deepening Divide? A Critical Analysis of Technological Reforms and Their Impact on Civil Procedure in India*, IJLRA, (Oct. 2025), <https://www.ijlra.com/uploads/661605765.pdf> (last visited, 20 June, 2026).

⁶⁰Id

⁶¹ Inst. for Competitiveness, State of India's Digital Economy (SIDE) Report 2024, cited in Taruna Solanki & Animesh Pareek, AI and Technology in the Indian Judiciary: A Step Toward Enhancing Efficiency and Equity, 45(1) Legal Reference Servs. Q. 85, 93–94 (2026), <https://doi.org/10.1080/0270319X.2026.2617784>, (last visited, 27 June, 2026).

⁶²James E. Cabral, Abhijeet Chavan, Thomas M. Clarke, John Greacen, Bonnie Rose Hough, Linda Rexer, Jane Ribadeneyra & Richard Zorza, Using Technology to Enhance Access to Justice, 26 Harv. J.L. & Tech. 241 (2012), <https://jolt.law.harvard.edu/articles/pdf/v26/26HarvJLTech241.pdf>. (last visited, 17 June, 2026).

under the Civil Procedure Code and the Criminal Procedure Code. This fragmentation creates inconsistency, jurisdictional uncertainty, and procedural vulnerability which becomes acute particularly in cross-state matters.

The Bharatiya Nagarik Suraksha Sanhita, 2023, has made a significant step by codifying video conferencing in specific criminal contexts⁶³, but a comprehensive framework addressing evidence standards in virtual hearings, authentication of participants, cross-border ODR enforcement, and the rights of self-represented litigants in digital proceedings is yet to be enacted. In contrast, Canada's Civil Resolution Tribunal Act and Singapore's Electronic Transactions Act provide unified, coherent legislative frameworks that lend legitimacy and enforceability to technology-assisted proceedings.

A Virtual Courts and Online Dispute Resolution Act may be passed in this regard that: (i) provides a uniform statutory basis for virtual court proceedings across all courts and tribunals; (ii) establishes minimum procedural standards for the conduct of virtual hearings, including participation rights, evidence authentication, and recording requirements; (iii) creates a statutory ODR scheme for civil disputes below a prescribed pecuniary limit, with outcomes enforceable as decrees of civil courts; and (iv) provides for the recognition and enforcement of cross-border ODR outcomes in alignment with the UNCITRAL Technical Notes.

6. Conclusion and Suggestions

The use of technology in administration of justice is not new, rather it is a constitutional requirement. The right to a rapid justice, which is guaranteed by Article 21 of the Constitution of India, and the series of decisions of the Supreme Court lays an affirmative duty upon the state, to eliminate all structural impediments to the timely settlement of disputes. The most potent tool the state has in the execution of this requirement is technology, in the shape of e-filing, virtual courts, the National Judicial Data Grid, ODR platforms, and many more mentioned above.

The project of e-Courts in India is a very clear and considerable investment in the modernisation of the judiciary. The video-conference of the 3.38 crore hearings that have been performed to date as of 2024, the transparency provided by the NJDG, and the innovation of the virtual traffic courts are the results of a real institutional value. But these gains should not

⁶³ Supra, note 21.

be considered only against themselves but against the constitutional measure of universal, substantive access to justice. With close to half the population in India having no reliable internet connections, with 9 out of 10 advocates in some surveys being ignorant of e-filing, and with no overarching statute regulating the virtual courtroom sessions that have become common practice, the disconnect between the technological infrastructure and the constitutional promise is still disturbingly big.

The comparative experiences of Singapore, British Columbia, England and Chile, as read in the light of normative models of UNCITRAL, the OECD and SDG agenda, propose a way forward; technology in the justice system should be people centric, inclusively designed, institutionally integrated, legally based, and empirically tested. Based on the above analysis, this paper presents an Integrated Digital Justice Architecture to India designed around five pillars: Firstly, Infrastructure Saturation has to be realized. Universal broadband connectivity of all court complexes, with mobile eCourt vans to cover taluka and tehsil level areas, and the effective utilization of Common Service Centres to provide court services to the citizens. Secondly, it should include virtual Courts at all levels of judiciary and ODR Act that gives a single legal framework to all digital court processes, replacing the existing hodgepodge of administrative orders and High Court regulations. Thirdly, Data Governance should be set up. Therefore, the creation of an effective law to create a full-fledged regime of the management, protection, and controlled use of judicial data, with a separate Judicial Data Oversight Authority, has to occur. Fourthly, it should achieve capacity building that can be operationalised by way of enforcing a compulsory digital literacy training to all judicial officers, advocates, and court staffs as a pre-condition of practice certification, to be taught at the National Judicial Academy and State Judicial Academies. Finally, the empirical monitoring may be provided through the assistance of the establishment of a Judicial Technology Impact Assessment Unit in the Law Commission of India that will produce the findings of the empirical evaluation of the e-Courts programme every 2-3 years and publish them in the reach of general audience. The infrastructure is present in India in terms of judicial technology programme. What it requires now is the acts of legislature, the culture of ground level study of the effects of the programs implemented, and the active role of Judiciary to bridge the gap between desire to provide an effective mechanism for swift justice delivery and the reality.