
REIMAGINING JUSTICE: THE ROLE OF TECHNOLOGY IN TRANSFORMING CRIMINAL JUSTICE SYSTEM

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ABSTRACT

The contemporary criminal justice system is undergoing a paradigm shift through the integration of advanced technologies, fundamentally reshaping law enforcement, prosecution, adjudication, and correctional processes. This paper critically examines the multidimensional impact of technological advancements on the Indian criminal justice system. Many technological advancements, including AI, cyber security, digital forensics, surveillance, etc., have significantly enhanced the prosecution of cases and law enforcement with a little chance of wrongful accusation or conviction. However, these have added up to some novel issues including privacy, data integrity, and ethical governance. The paper analyses the use of technology in various aspects including prosecution and correctional system. The paper also talks about balancing the technological advancement with the constitutional rights, especially in light of India's evolving data protection laws and infrastructural limitations. Also, the paper seeks to analyse the effect of technology on the prosecution, punishment and law enforcement.

Keywords: Artificial intelligence, prosecution, technology, punishment, criminal justice system

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I. Introduction:

The criminal justice system is currently experiencing vast changes everyday, which are, in large measure, due to rapid technological developments. Universal connectivity and Digital India initiatives are spreading in all areas. In fact, because of which there is an increase of internet subscribers from 251.59 million in 2014 to 954.40 million in 2024.³ From predictive algorithms to digital evidence management, the introduction of new tools is reinventing the way justice is imagined, distributed and experienced. This change is not only administrative in nature; it has sweeping effects on prevention, detection, investigation, court proceedings, as well as the participation of victims, and even the general terrain of legal accountability.⁴

Evidence collection and analysis is one of the cornerstone of the whole process of the justice system that has undergone the most extensive changes because of technology. Tools such as biometric ID, CCTV surveillance, and forensic DNA analysis, and digital forensics, have impacted how crime is to be investigated, in a revolutionary manner. Biometric data, i.e. fingerprints, iris scans, etc. are now used daily to confirm identities, advanced forensic techniques help recreate crime scenes more accurately. Such developments go beyond strengthening the ability of law-enforcement agencies to conduct efficient investigations; it mitigates the risk of having the wrongly accused arrested and prosecuted, as evidence thus become more reliable and verifiable. However, continuous use and constant deliberation can help in the development of these technologies.

In judiciary, technology is enhancing case-handling and procedures' openness. Virtual record of court records and e-filing systems eliminate administrative delays, and accelerate access to case files. Virtual courtrooms particularly important in times of crisis, have made it possible for the judicial proceedings to continue without interruption even in the limiting environments. Artificial intelligence (AI) is also making an inroad in judicial reasoning tools to provide data-driven analysis of sentencing patterns or case law precedents, but ethical issues remain with insistence on leaving decisions about human beings in the hands of algorithms.

For culprits, technological advancements bring new ways to interact and be shielded. Victim portals enable people to monitor updates for cases, to submit documentation or to request

³ Press Information Bureau Available at: <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2040566> Last visited on 27 July, 2025.

⁴ Smith, G.R., Crime Control in the Digital Age: An exploration of Human Right Implications, *International Journal of Cyber Criminology* 1(2), 2007, pp. 167-179, p. 167.

services delivered through the Internet thus increasing their involvement in the justice process. Similarly, wearable devices and mobile applications can be used to safeguard bail condition or monitor persons at risk of reoffending thus, striking a balance on the rights of an accused and public safety.

As it happens, policing, one of the, perhaps, first movers in the utilization of the latest technology, has been particularly more in news. The predictive policing models research crime patterns and social-economic information to enquire the possible occurrence of the crime and when and where it can happen as well as how they will proceed with the case.⁵ Although this has improved response time and effectiveness, the issue of systemic bias and over-policing in disadvantaged communities remains of utmost concern. The access to body-worn cameras is expected to facilitate the responsiveness of police-public encounters, as it would allow increasing the level of transparency. But the question is to standardize usages of such technologies and the data produced is to be made accessible, safe, and misused.

Both big data analytics and artificial intelligence are of significant importance in the operation of the new criminal justice institutions. AI tools are useful both in assessing a risk and granting parole and also in dealing with large amounts of law cases and legal texts. When used in ethical methods, predictive analytics can be of great significance in dispelling the judicial backlog and in the estimations of litigation. But the murkiness of many algorithmic arrangements critically questions issues of fairness, accountability, and transparency especially when these tools shape decision such as sentencing or bail.

It can also be used in other ways for correcting past wrongs like false or unfair convictions by incorporating technology. Since the introduction of high-tech DNA testing, we have seen many documented and detailed exonerations sometimes exposing distortions of old investigation methods. Digital case management systems can call attention to inconsistencies in the witness testimony, or evidence, thus helping to avoid the kind of errors that lead to miscarriages of justice. Furthermore, machine learning models trained on court records may discover the patterns of bias or systematic issues resulting in procedural justice or fairness, and, once implemented, would yield considerable value.

⁵ Mc Clendon L., Meganathan N., Using Machine Learning Algorithms to Analyse Crime Data, Machine Learning and Applications: An International Journal, vol. 2(1), 2015, pp. 1-12, p. 5.

When we talk about incorporating technology in the criminal justice system, it also has many threats along with it. Though most of it can be taken care of by proper regulatory measures but issues like data privacy, unchecked surveillance, and the unequal spread of racially biased technologies can create more inequality. Also, there are other levels of marginalization which cannot be confined into a straight jacket formula. For eg., marginalized person who does not have access to digital tools, would be left out of online legal resources or virtual hearings. Also, if the algorithmic tools are trained on biased data, it would also be prejudicial and would also add up to marginalization.

Integrating technology of course has quite a lot of benefits, but it requires management with a focus on accountability, ethical values, and sound governance. Integrating technology in the system does not mean digitizing the old process; it should lead to a system that truly values justice and promotes openness, fairness, and equity. It can significantly help reduce wrongful convictions, improve efficiency, and increase access to justice. However, misuse and unregulated technology can introduce new errors, discrimination, and inefficiencies. There must be a deliberate effort to make sure that technology supports what we can call social justice.

II. Impact on Law Enforcement and Investigation: A Technological Transformation:

The situation of the criminal justice system has been heavily transformed by technology as police and investigation processes undergo drastic changes. New technologies like artificial intelligence, biometric tools, digital forensics have been utilized for effective and efficient policing. Although these innovations present exciting prospects for enhancing security, accuracy and response time efficiency, the matters of privacy and data integrity, and ethical governance have popped up.⁶

Modernization of Investigative Techniques:

The law enforcement agencies have undergone a paradigm change where the traditional old practices of manual investigation have been replaced by technology-based approaches. CCTV monitoring, automated fingerprint identification systems, facial recognition programs and other digital devices have also enhanced the police ability to hold, collect and evaluate the

⁶ Malik P. & Nimesh S., "Impact Assessment of emerging Technologies on Criminal Justice System" International Journal of Law Management & Humanities, vol.6 ,2023, pp 3405-3417, p.3406.

evidence as quickly as possible. These devices or process not only expedite investigations but in most cases increase the evidence generating successful prosecutions. For example, the value of identifying suspects from the images provided by CCTV contributes to the effectiveness of investigations⁷ because they provide actual visual records of occurrences.⁸

Along with that, the emergence of crime mapping and geographic information system (GIS) has made law enforcement agencies aware of the ability to use predictive policing. These plans help the authorities preplan the crime patterns and allocation of resources to address and prevent crimes effectively being a more proactive approach in contrast to reactive. The data on the crimes allow the machine learning algorithms to identify where crime is happening as well as detect trends in criminal behavior which would in turn inform strategic planning⁹.

Biometric Advancements and Surveillance:

Biometric technologies such as facial recognition and fingerprint readers may be changing the police investigation processes in establishing a criminal identity. Biometric systems, even with issues of accuracy, are becoming widespread. As procedures, they successfully track recidivists and are able to compare identities as they are saved in criminal database systems as per the degree of similarity without any human intervention.¹⁰ As with any emerging technology, moral arguments about the ethics of the technology stem from issues around the accuracy of false-positives, racism, potential misuse of surveillance data, etc.¹¹ In some jurisdictions, facial recognition is considered a technology that had a negative impact on minority groups and was effectively elevating the risk of human rights infractions, in particular privacy and freedom of movement.

The dimension of law enforcement is created through steered automated surveillance systems: drone technology combined with real time video analytics. With these tools it is potentially possible to survey large swaths of territory with very minimal human overhead control; collect the data in real time; identify individuals and vehicles. Although this may be valuable in

⁷ Clarke, R. V., Situation Crime Prevention Crime and Justice 19, 1993, pp. 90-160, p100

⁸ Ashby, M. P. J., The value of CCTV surveillance cameras as an investigative tool: An empirical analysis, European Journal on Criminal Policy and Research, vol 23, issue 3, (2017), pp. 441-459, p 455.

⁹ Boskovic M. M., Implications of new technologies on Criminal Justice System, Journal of Eastern European Criminal Law, vol. no.2, 2020, pp137-148 p. 143.

¹⁰ Moses, K. R., Automated Fingerprint Identification System, In: fingerprint Sourcebook National Institute of Justice, Washington DC, (2011) p 27.

¹¹ Jesper R., "Neuroscience and Criminal Justice: Introduction" The Journal of Ethics (2014),vol.18, pp.77-80, p.78.

deciding how to respond as it keeps one aware of the situation, many layers of consideration must be given in developing these systems¹², balancing control against abuse and individual rights.

Digital Forensics and Evidence Integrity:

The advancement of electronic communications and business has necessitated cyber forensics. Investigators are now routinely able to compile information on digital footprints - whether it be email, social media activity, transactional logging for evidence gathering purposes. It is important for preserving the data as it can easily be tampered with. In order to retrieve, preserve and present both digitally created and stored data high tech tools are used. They are digital evidence can be produced in court of law at any later stage.

Digital evidence management needs also some specific training especially in law enforcement.¹³ Digital evidence also includes critical evidence which needs proper disposal to prevent injustice. That's why continued professionalism development and collaboration with cyber forensic professionals is so important so that digital investigations are not just reliable but also valid in the legal scenario.

Data Analytics and Artificial Intelligence:

Artificial Intelligence can be major tool for analysing decisions in law enforcement. It ranges from analyzing large volumes of information on crime patterns, to identifying patterns which could indicate the evidence and its relation with crime. AI assists in law enforcement, decision-making, applying resources. It was based on the argument that the data on which it is being trained is impartial, objective and fact based.¹⁴ But implicit in the use of AI, is the issue of transparency, accountability and the bias in training data.¹⁵ Presently, it is being used with little

¹² Blumstein, A., "Systems Analysis and the Criminal Justice System." *The Annals of the American Academy of Political and Social Science* (1967), pp.92-100, p.93-95.

¹³ Malik P. & Nimesh S., "Impact Assessment of emerging Technologies on Criminal Justice System" *International Journal of Law Management & Humanities*, vol.6 ,2023, pp 3405-3417, p.3414.

¹⁴ Miller, A. P., Want less biased decisions? Use algorithms. *Harvard Business Review*, July 26, 2018 last visited on 27 July, 2025

¹⁵ Tunstall, S.L., "Models as Weapons: Review of Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy by Cathy O'Neil (2016)." Vol 11 issue 1 (2018): Article 10, p.1. DOI: <https://doi.org/10.5038/1936-4660.11.1.10>; Also, O' Neil, C., *Weapons of Math Destruction – How Big Data Increases Inequality and Threatens Democracy*, (New York, Crown Publishers, years), (2016).

foresight or supervision; or they may be too broadly used in their decision-making, risks producing biased results that could lead to disproportionate or deny due process.

Privacy and Data Protection:

The police and intelligence agencies are collecting and storing large amounts of data on individuals. Though there are other methods for surveillance and data analysis, they need to keep individual privacy in mind. Legal jurisdictions defining laws pertaining to data protection that regulate how government agencies collect, store, and use people's personal information. However, the effectiveness is constantly in question, especially when state authorities use national security claims to justify monitoring citizens.

A major challenge is finding the right balance between successful law enforcement and constitutional protections. Policymakers must see that new technology is used alongside both new and existing legal protections. They also need judicial oversight and transparency to prevent misuse or abuse, while maintaining public trust.

Implementation Challenges in the Indian Situation:

Law enforcement technology in India has been progressing, but not consistently. The Crime and Criminal Tracking Network and Systems (CCTNS) project aims to digitize police records and create a central database for better coordination across different jurisdictions. While the project holds significant promise, it can only work if the necessary infrastructure is developed, training is provided, and state-level databases are integrated into a single database.

Although the K.S. Puttaswamy¹⁶ ruling has recognized privacy as a fundamental right, much more needs to be done. India still lacks a solid framework for protecting digital data. The gap in how law enforcement handles personal data makes it vulnerable to risks and undermines public trust in technology. Recently, the Digital Data Protection Act, 2023¹⁷ was passed, providing a framework for processing digital personal data, but it has yet to be enforced.

III. Effect of Technology on Prosecution and Adjudication:

Using technology in the criminal justice system has greatly affected the fields of prosecution

¹⁶ Justice K.S. Puttaswamy v. Union of India (2017) 10 SCC 1.

¹⁷ The Digital Data Protection Act, 2023.

and adjudication. India has a long history of difficulties with delay and backlogs, technology offers some hope in reducing them but also creates some obstacles.

Prosecution in a Digitally-Driven Framework:

Prosecutors act as an important wing in the administration of justice in the State by representing the State to make sure that an accused person is held liable in accordance with the law. Earlier, prosecution mainly comprised of analyzing the evidence manually and testing the preponderance of probability in a civil case and beyond reasonable doubt in a criminal case by the Judge. The digital age has influenced the manner in which the case is put forth. In today's time, the prosecutor can easily manage the case even being away from the court, by tracking and monitoring all steps taken.

The prosecutor can convert physical case-file documents into an electronic database to include scanned material, CCTV footage, forensic materials, and mobile device data.¹⁸ These digital options also increases the prosecutor's ability to build persuasive and logical arguments. For example, new tools can help prosecutors retrieve deleted text messages and, retrieve metadata to produce timelines that may have been virtually impossible to develop before digital tools. Also, by having digital versions of law and accessing online research tools, more comprehensive research has been possible as compared to the traditional approach.

Conversely, the technological advancements have brought additional challenges. A great caution is required on the part of prosecutors so that the digital evidence is handled properly. The prosecutors now have to understand technology, which means that training is required, as failing to have expertise in this area results in valuable evidence being suppressed, or cases being delayed.

Adjudication: From holding hearings on paper to handling them online:

The process of how judges review and make decisions regarding their cases has evolved considerably. In the recent times, courts are shifting toward using more online hearings, filing documents electronically, and utilizing electronic presentations of exhibits¹⁹. With the use of

¹⁸ Goswami P., Goswami A., Virtual Justice: The Role of Technology in Transforming Criminal Administration, *Integral Law Review* (2024-25), vol. 3, pp1-28, p 15.

¹⁹ Boskovic M. M., Implications of new technologies on Criminal Justice System, *Journal of Eastern European Criminal Law*, vol. no.2, 2020, pp137-148 p. 139.

COURTNIC and JUDIS²⁰, which are widely used in India, digital access to lists of cases and court judgments available to the public makes it easier and quicker to make decisions in court while remaining more transparent.²¹

Online adjudication became more prominent during pandemic due to limited meetings of parties. Digitization acted as a boon for administration of justice. Judges, lawyers, and litigants could participate in trials remotely, which continued the administration of justice without the logistic challenges of travel through video conferencing. Both the costs involved and access to the whole process for those living long distances improved because of digitization.

The application of technology has improved in the adjudication process and functioning of the courts.²² Through the Digital Evidence Presentation Systems, advocates can present audio, video, and 3D-generated evidence at trial. Their use helps make arguments easier to understand by judges and also makes them seem stronger. Earlier, before the enactment of the new criminal laws, some of these evidences were made admissible under Section 65 B of The Indian Evidence Act, 1872.²³ However, upon the operation of the new law, the electronic or digital evidence is treated as primary evidence²⁴, and the admissibility procedure of these records has been simplified.

Handling the Difficulties Related to Backlog and Delay:

Delay is one of the obstacles currently faced by the Indian adjudication system. Delay occurs when the time taken to resolve a matter exceeds the acceptable period which is envisaged.²⁵ Inadequate judges, outdated laws, and poor infrastructure, poor judge case ratio all contribute to this problem.²⁶ The introduction of technology would streamline case management tasks in courts and decrease their backlogs. The trial run of digital cause lists, digital case filing, and electronic case tracking has made progress in the states that have tested such tools.

²⁰ The Judgment Information System, India, available at: <http://judis.nic.in/> last visited dated on 27 August, 2025

²¹ Goswami P., Goswami A., Virtual Justice: The Role of Technology in Transforming Criminal Administration, Integral Law Review (2024-25), vol. 3, pp1-28, p 7.

²² Philips A., Godfrey R., E-Discovery: An Introduction to Digital Evidence 65-67 (Cengage Learning, 2013).

²³ The Indian Evidence Act, 1872, S. 65B.

²⁴ The Bhartiya Sakshya Adhiniyam, S. 63.

²⁵ Inaugral Address of Hon'ble Dr. Justice A.S. Anand, Chief Justice of India, at the Golden Celebration of Rajasthan High Court (1999).

²⁶ Goswami P., Goswami A., Virtual Justice: The Role of Technology in Transforming Criminal Administration, Integral Law Review (2024-25), vol. 3, pp.1-28, p 4.

While the initiative is promising, the efforts of many of the users will not reduce the digital divide unless the environment is also made technology- friendly.²⁷ The rural and lowest tier courts often do not have the necessary support or capacity to make good use of digital tools that are capable of creating a more equitable system. In addition, while higher courts have successfully used digital tools in case management, district and Mofussil courts often struggle with inadequate resources and outdated processes.

Lengthy delays in trials create additional anxiety and trauma for distressed individuals. It often erodes the public's trust.²⁸ Effective digital case management can potentially address these issues by conforming all of those involved to what is happening, what will happen, and who is responsible.

Role of AI in decision making:

AI is emerging as an increasingly important advisable option for fact-finders in court. In some jurisdictions, decision support systems such as COMPAS, are regularly providing courts with the likelihood of recidivism for offenders. Courts in India have not adopted the use of AI in this manner, but they are, however, talking about the use of AI in three general categories: court administration and management, research, and sentencing.

The advantages of AI include better consistency in decision-making, fewer hours of manual work, and knowledge gained from data through past researches. Nevertheless, the ethical challenges are still significant. It is possible that AI would replicate and reinforce the biases inherent in the data it has been trained on and would perpetuate or further exacerbate an unfair treatment of offenders. Also, if the algorithms are poorly understood it may also violate the rule of reasoned judgment. However, the present demands a change in the adjudication process so that it can be streamlined. AI can be very helpful in this change and can act as a guiding light.

These days, ODR and virtual courts have been very common where the technologies are resorted to for streamlining the process.²⁹ However, people must trust these platforms and learn how to secure them. It can be hard for some litigants to learn how to use online systems. So, it

²⁷ Pattavina A., *Information Technology and The Criminal Justice System* 261-263 (Thousand Oaks, California, USA: Sage Publications, 2004).

²⁸ Goswami P., Goswami A., *Virtual Justice: The Role of Technology in Transforming Criminal Administration*, *Integral Law Review* (2024-25), vol. 3, pp1-28, p 11.

²⁹ Goswami P., Goswami A., *Virtual Justice: The Role of Technology in Transforming Criminal Administration*, *Integral Law Review* (2024-25), vol. 3, pp1-28, p 18,19.

is necessary to promote digital literacy and support the development of needed infrastructure to achieve equality.

Digitization and Evidence Integrity:

Any change to courtroom workflows means new rules must be put in place for securing evidence. Under Indian law and the related guidelines, all electronic evidence must be verified and it must be clear where it comes from. Documents sent electronically are routinely admissible, if they meet the rules set by the courts. It is common to use fabricated data, timestamps, and the study of metadata to make sure a document is real.

At the same time, managing, saving, and getting digital data has become harder due to its growing amount. All law enforcement should adjust to these issues to make sure judgments are trustworthy. Spinning up secure cloud storage and new data analytics solutions is necessary for the change.

IV. Impact on Punishment and Correctional Systems:

The area of punishment and correction has changed because of advances in technology, changes in society, and laws concerning crime. These days, the main goals of punishment are progress toward rehabilitation, reaching human rights, and successful reintegration. It is quite noticeable in India, where the idea of reformative justice is becoming more common although there are hard systemic and structural problems that refuse to disappear.

Changing Philosophies of Punishment:

A criminal justice system uses multiple goals and emphasizes preventing crime, punishing offenders, isolating offenders from society, and rehabilitating offenders. However, experts from around the world are coming to the realization that punishment won't lead us to public safety by punitive means alone. Increasingly individuals are paying attention to non-custodial sentences, open prisons, probation and parole, and community corrections. The guidelines created by the Indian court make note of the assumption that a death sentence can be imposed in the rarest of cases. It symbolizes a preference for a lighter touch.

It is apparent from numerous open-air prisons and the growing policies of parole and probation, that provide a chance for rehabilitation after serving the sentence. In addition, such an approach

allows some of the burden to be off from prisons and provides a chance to address the social issues that may have influenced criminal behaviour.

Technological Advancements in Corrections:

One notable way in which correctional systems have changed is through the use of technology. Electronic monitoring devices such as GPS positioned ankle bracelets began as a replacement for incarceration of low-risk offenders. These devices can be used to know where somebody is located and to keep them accountable for certain restrictions without putting them in jail. There are various evidences of the acceptance of electronic monitoring in preventing imprisonment in Europe and North America but mainly around home confinement and curfews.³⁰

Artificial intelligence (AI) and predictive analysis have been integrated into the world of correctional planning. Systems like COMPAS (Correctional Offender Management Profiling for Alternative Sanctions) help the courts determine the level of risk of recidivism, when deciding on bail, sentencing, or parole.³¹ There may be efficiency gains, some concerns around algorithmic bias and transparency, but it's fair to say that we are utilizing this data to make correctional decisions.

Infrastructure and Human Rights Concerns:

Despite the optimistic prospect for reform, the realities in many developing countries are bleak. In India, overcrowding, unsanitary conditions, inadequate staff and lack of healthcare seriously affect the wellness of inmates. Women, youth, and members of marginalized communities demonstrate an increased vulnerability due to systemic shortcomings. The problems outlined above are evidence that the conditions of incarceration urgently require changes to the infrastructure of prisons and the implementation of rehabilitation methods that are reflective of constitutional protections, and in accordance with international human rights standards.

The emphasis on advancing infrastructure and treatment of the inmates is greater these days.³²

³⁰ Nellis, M., Understanding the electronic monitoring of offenders in Europe: Expansion, Regulation and Prospects, *Crime Law and Social Change*, 2014, vol. 62, Issue 4, pp. 489-510, p 489.

³¹ Brennan T. Dieterich W., Ehret B., Evaluating the predictive validity of the COMPAS Risk and Needs Assessment System, *Criminal Justice and Behaviour*, (2009) 36(1), pp. 21-40, p. 25.

³² The United Nations Standard Minimum Rules for the Treatment of Prisoners (the Nelson Mandela Rules), United Nations Office on Drugs and Crime, Available at: https://www.unodc.org/documents/justice-and-prison-reform/Nelson_Mandela_Rules-E-book.pdf

The notion of separating under-trials from convicted criminals,³³ educational, and vocational training,³⁴ and providing psycho-social counselling are evidence of attempts to improve the rehabilitation of inmates. Prisons will update their technologies, inmates' rudimentary detention conditions add to the challenge of determining the fate of the prisoners; updating camera surveillance, providing biometric, or facial recognition, and digital records of prisoners may ensure safety, transparency, accountability.

Rehabilitation and Social Reintegration:

The ultimate aim of any correctional system should be the successful reintegration of offenders into society. This is not simply addressing criminal behavior, but providing individuals with the necessary tools and support systems to live productive lives. Moreover, rehabilitation programs appropriate to crime, especially with respect to literacy, skills training, mental health, should be accepted as part of correctional policy.

In India, several reformative programs have been instituted in jails, with an emphasis on juvenile and women inmates, to provide previously incarcerated individuals with tools for educational and entrepreneurial considerations. The success of reintegration, however, relies on appropriate post-incarceration support such as employment, housing, and acceptance or social inclusion—all of which continue to remain substantially undeveloped.

The stigma of incarceration³⁵ continues to also negatively affect the reintegration process, resulting in a cycle of reoffending and exclusion from society. Therefore, efforts must extend beyond institutional reforms to include public sensitization and corporate engagement for the rehabilitation of ex-offenders.

Globalization and Comparative Approaches:

International comparisons shows that countries with lower incarceration rates tend to prioritize alternative sanctions and community-based corrections. Scandinavian models, for instance, focus on normalized prison environments, open correctional facilities, and strong social support

³³ Ibid, rule 11.

³⁴ Ibid, rule 4.

³⁵ Fentahun S., Perceived stigma, social support and depression among prison inmates in Northwest Ethiopia: Using structural equation modeling, *Journal of Affective disorders Report*, 2025, vol. 21, p.1-8, p.1

networks. These systems reflect an underlying belief in the capacity of individuals to change and the responsibility of society to facilitate that transformation.

In contrast, systems that emphasize punitive measures and mass incarceration often suffer from higher recidivism rates, prison overcrowding, and human rights violations. Indian policymakers are increasingly advocating for alternatives to imprisonment, especially for non-violent and first-time offenders learning from the global standards.

V. Rights, Liberties, and Constitutional Concerns in the Criminal Justice Framework:

The evolution of modern criminal justice systems, particularly in democratic nations like India, necessitates a balance between sovereign and individual rights. These are not only foundational to the constitutional framework but are also fundamental to the legitimacy of criminal law and its enforcement. In the Indian context, the Constitution is the guardian of civil liberties. It protects individuals from arbitrary action taken by the State, particularly when they are accused or suspected of criminal behaviour. However, the increasing use of technology in criminal justice; while beneficial, raises new forms of constitutional and ethical implications.

Constitutional Protections in Criminal Proceedings:

At the core of the Indian criminal justice system is the protection afforded by Part III of the Constitution – i.e. fundamental rights. Within Part III of the Constitution, the most important are Articles 20 and 21. Article 20³⁶ protects self-incrimination, double jeopardy, and ex post facto criminal laws. Article 21, having a broad interpretation from Indian courts, guarantees a right to life and personal liberty. Article 21³⁷ has been the genesis for rights such as the right to legal aid, a right to a fair trial, and rights relating to humane treatment of prisoners.

Through a number of developments and landmark judgments, the judiciary has transformed procedural fairness in criminal proceedings as a constitutional requirement. The right to counsel, the presumption of innocence, and protection from arbitrary arrest and detention are all considered fundamental to the idea of justice. These constitutional rights and protections

³⁶ The Constitution of India, 1950, Art. 20.

³⁷ Ibid, Art. 21.

are a check on the coercive powers of the state, allowing the system to carry on the rule of law even for those accused of serious offences.

VI. Technological Innovation and Emerging Civil Liberties Challenges:

The increasing reliance of law enforcement agencies on the work with technology—such as facial recognition software, surveillance cameras, predictive policing tools, biometric databases, etc.—has brought the interrelationship between advances in technology and civil liberties into stark focus. While technology can enhance outcomes with respect to detecting and preventing crime, it can undercut principles of privacy, due process and non-discrimination. It is vital to make sure that the challenges of civil liberties must be managed concurrent to the advances being made with technological innovation.

The utmost constitutional concern is of the right to privacy, which was affirmed as a fundamental right in *Justice K.S. Puttaswamy v. Union of India*³⁸. This decision emphasized that surveillance and data collection by the state must meet the tests of legality, necessity, and proportionality. In the absence of robust data protection laws, the use of digital tools in criminal investigations can jeopardize constitutional values through misuse and overreach.

Predictive policing and AI-driven risk assessment models, for instance, have been criticized for reinforcing systemic biases and lacking transparency in decision-making. These tools, if not carefully regulated, can undermine the principles of equality and non-arbitrariness enshrined in Articles 14³⁹ and 21, thereby eroding public trust in the justice system.

Rights of the Accused and Protection from State Overreach:

The rights of persons accused of crimes is often tested from the view of investigative methods, pre-trial detention, and custodial practices. The Constitution, whose substantive guarantees are supplemented by statutory protections tries to limit state's interference with personal liberty. In practice, arbitrary detention, custodial torture, and refusals of bail demonstrate that the gap between institutional reality and the constitutional promise is significant.

The presence of wrongful convictions illustrates the depths of harm in breach of these principles. The dignity, liberty, and status of persons who are wrongfully accused or convicted

³⁸ Justice K.S. Puttaswamy v. Union of India (2017) 10 SCC 1.

³⁹ The Constitution of India, 1950, Art. 14.

are often irreparably damaged. While compensatory remedies have been established in the Indian judiciary's case law, there continues to be no statutory compensation scheme governing wrongfully accused persons. This legal gap raises deep concerns about the constitutional promise, and the legal and moral foundations for the state's actions.

Victims' Rights: Expanding the Constitutional Horizon:

While much of the constitutional discourse has historically focused on the accused, the rights of crime victims are now gaining recognition. Amendments to the Code of Criminal Procedure⁴⁰ and now The Bhartiya Nagarik Suraksha Sanhita, 2023⁴¹ and various judicial pronouncements have expanded the procedural rights of victims, including the right to participate in legal proceedings and seek compensation from the state.

The constitutional challenge lies in balancing the accused's rights with those of the victims.⁴² Ensuring a fair trial must not come at the cost of silencing victims, especially in cases of gender-based violence or crimes against children. A victim-centric approach, anchored in constitutional values of justice, equality, and dignity, is essential to making the criminal justice system more inclusive and responsive.

Custodial Rights and Correctional Justice:

When a person is arrested - either as an undertrial or convict - the State's duty to follow a citizen's constitutional right is stressed even more. For example, Article 21 concludes that a person cannot be deprived of their life or personal liberty without the same being provided by a just, fair and reasonable procedure.⁴³ This stresses the State's obligation to respect prisoners' rights in the prison environment, the prisoners' right to representation and the prisoners' right to be free from inhumane circumstances in a correctional facility.

While the Constitution either directs the State to dispose of these obligations or some may even say confers the rights upon the prisoner - the reality is that the Indian prison context is often plagued with overcrowding, sanitary conditions, abuses and violence, lack of healthcare and

⁴⁰ The Code of Criminal Procedure, 1973

⁴¹ The Bhartiya Nagarik Suraksha Sanhita, 2023.

⁴² Laura A. W., The rights of Victims vs the rights of the accused: Striking a balance between the rights of victims and accused persons in the international criminal justice setting, *University of Western Law Review*, vol. 38, issue 2, January(2015) pp. 152-174, p. 152.

⁴³ The Constitution of India, 1950, Art. 21

so forth. Vulnerable populations - with women, juveniles and people representing lower socio-economic classes in particular are the worst affected. The cases reveal a systemic divergence from the structures represented in the Constitution, and what is actually enacted.

Toward a Rights-Respecting Justice System:

In order to have the criminal justice system function with constitutional values, a rights-based approach must inform the law-making process and institutional practices. Regular reviews must take place regarding the law-making process and regulations to assess the viability of fundamental rights being achieved, particularly when it comes to issues presented by fast-tracked technological advances. Change requires a stream of new institutional reforms that account for police accountability; developing the judiciary; independent public prison oversight; and/or ensuring rights-based situational awareness in the everyday practices of front-line workers to ensure constitutions are upheld.

Public education and legal awareness initiatives are just as important for improving constitutional governance. An informed and engaged citizenry about their rights and limits on state control will hold governments accountable.

VII. Global Practices and Comparative Analysis in Criminal Justice:

Criminal justice systems around the world offer significant variation in philosophies, institutions, and practices. Despite these differences, countries grapple with similar issues - providing timely justice, protecting human rights, incorporating technology, and balancing state power and individual liberties - and countries are driven to learn from each other.⁴⁴ Comparative analysis of global practices presents opportunities for countries, including India, to improve their justice systems for greater efficiency, inclusivity, and technology.

Western Legal Systems: Emphasis on Due Process and Technological Integration:

In the contexts of the US and the UK, technology has become an important aspect of criminal justice. The US has adopted electronic monitoring technologies, police predictive technologies, and tools that leverage algorithms and artificial intelligence, like COMPAS, for pretrial,

⁴⁴ Joint Communication to the European parliament, the Council, the European economic and Social Committee and the Committee of Regions Cybersecurity strategy of the European Union: An Open Safe and Secure Cyberspace (2013), p. 2.

sentencing, and parole guidance. These technologies may aid in efficiency and save lives, but needs to examine algorithmic bias and fairness in general, transparency for data-based processes, and race-based enforcement - taking situations of technology-based justice from accountability to judicial oversight responsibility.⁴⁵

The United Kingdom's approach to technology, including virtual court processes in the context of COVID-19, adds to its mechanisms that protect people's digital rights, and the measurable process of practices around data protection and unlawful surveillance. This shows that although their technologies afford greater access to justice in both jurisdictions, it is through ethical and legal frameworks we can understand their use.

Scandinavian Countries: Human-Centric and Reformative Approaches:

The Nordic model, especially seen in countries like Norway and Sweden, is often regarded as the gold standard for correctional systems. These countries emphasize rehabilitation more than punitive punishment. For example, Norway prison architecture is meant to feel most like normal, everyday living with the goal of transitioning inmates back to society as smoothly as possible. Prisons have vocational training, help with psychological problems, and offer community engagements

Such systems have aided in achieving much lower recidivism rates than more punitive systems. The Scandinavian experience shows that treating offenders humanely may not jeopardise public safety but may actually enhance public safety through deduction of future criminal behaviours; and India, which face overcrowded jails and a punitive hangover from colonial-era statutes, these models provide an appealing alternative based on restorative justice.

European Union: Legal Harmonization and Cross-Border Cooperation:

The EU has developed several avenues for cross-member-state cooperation in criminal justice, including the Prüm Convention, which enables the sharing of DNA, fingerprints, and vehicle registration information across member states.⁴⁶ This level of integration highlights the role of

⁴⁵ Boskovic M. M., Implications of new technologies on Criminal Justice System, Journal of Eastern European Criminal Law, vol. no.2, 2020, pp137-148 p. 143.

⁴⁶ Council Decision 2008/615/JHA of 23 June 2008 on stepping up of cross border cooperation, particularly in combating terrorism and cross border crime.

interoperable technologies and uniform legal processes in combating transnational crime.

The EU has made remarkable strides in regulating surveillance and safeguarding digital rights as well. The General Data Protection Regulation (GDPR)⁴⁷ has become a model for personal data protection worldwide, and especially in law enforcement. EU courts have ensured that the new technology which provides for new ways of policing and surveillance does not infringe on civil liberties. Since, India is still a developing country, these can be good examples from which India could enact its own policies according to its own circumstances.

Asian Perspectives: Hybrid Models and Institutional Challenges:

Asian nations exhibit a great variety of criminal justice approaches. It ranges from Japan's efficiency-based model to more punitive models in Southeast Asia. Japan has a highly efficient prosecution system, with over 99% conviction rates.⁴⁸ This is due mainly because of the discretion given to the prosecution. However, some claim that it discourages dissent and pre-negotiated pleas.

On the other hand, countries such as Singapore and South Korea have successfully adopted technological developments into law enforcement and forensic science but have sustained rule-of-law institutions as well. These countries show that leveraging technological advancements can keep devotion to judicial accountability, provided there is institutional support to accountability, which includes transparency and community involvement.

Conversely, in developing countries, including India, the criminal justice system still experiences delays, and is deficient in a lack of infrastructure and inadequate legality. The introduction of digitization in the criminal justice system, such as India's Crime and Criminal Tracking Network and Systems (CCTNS), has not yet reached the successful stage of digitization as in developed countries, primarily due to patchy implementation and the society's lack of digital literacy. However, its progress is still continuing and will reach the required standard in the days to come.⁴⁹

⁴⁷ Available at: <https://gdpr-info.eu/> last visited on 27 July 2025

⁴⁸ Aronson B., Carlos Ghosn and Japan's '99% Conviction Rate' – The Diplomat, 31 March 2020 Available at: <https://thediplomat.com/2020/03/carlos-ghosn-and-japans-99-conviction-rate/> last visited on : 5 August, 2025.

⁴⁹ Press Information Bureau, Available at : <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2087523>, last visited on 6 August, 2025.

Global Best Practices and India's Reform Agenda:

A successful criminal justice system has not just a range of technological capabilities but also people's participation and coordination at the institutional level. India still has many possibilities of reform in different areas to bring out one of the best criminal justice systems of the world.

First, creating a protocol for handling digital evidence and requiring judges to receive training in forensic science would help protect the integrity of the trial process. Second, we need to change correctional facilities, transforming overcrowded and underfunded prisons into places that support rehabilitation. Third, India's draft data protection law should aim to meet global standards to safeguard citizens from wrongful or excessive surveillance and from the misuse of their personal information by public officials.

To bring the change, an effective cross-border cooperation is also required. A swift and better mechanism is required to curtail the significant and rising rates of cybercrime, financial fraud, and international terrorism. The establishment of a network of digital forensics labs, enhanced cyber policing, and educational programs for judges and prosecutors to understand transnational criminal law, will be of paramount importance. Also, successful implementation of all these require organized channels and multifold strategies to bring out the maximum use of these technologies.⁵⁰

VIII. Recommendations and the Way Forward:

India's criminal justice system is at a crucial juncture between tradition and change. While it has a good constitutional framework, the ever-evolving nature of crime, excessive use of technology in investigating crime and changing costs of crime and international benchmarks require a holistic overhaul. The Indian state will have to adopt a multi-dimensional and rights-based approach to allow justice delivery to be fair, transparent, and efficient into the future. The following recommendations seek to address structural, procedural, technological, and human rights issues and consider a pathway for progressive reform.

⁵⁰ Pattavina A., *The Future of Information Technology in Criminal Justice: Prospects and Challenges* (Thousand Oak, California, US, Sage Publication 2004).

1. Enact a Robust Data Protection and Surveillance Law:

With law enforcement increasingly relying on digital surveillance, facial recognition, and biometric databases, it is essential that these technologies are regulated by law and operate under judicial oversight. The proposed data protection legislation must address not only commercial data usage but also state surveillance practices, ensuring that personal data is collected and processed only when necessary, proportionate, and within a framework of accountability. Consent, transparency, and independent redress mechanisms should form the core of such legislation to prevent its misuse and protect fundamental rights. The recent data protection law⁵¹ though enacted has not yet been enforced.

2. Strengthen Legal Framework for Digital Evidence:

The exponential growth of cybercrime and digital transactions necessitates modernized laws governing the collection, preservation, and admissibility of electronic evidence. India's Evidence Act and procedural laws must be amended to incorporate international best practices, including standard protocols for handling metadata, chain of custody documentation, and the use of forensic tools. Though the Bhartiya Sakshya Adhiniyam, 2023⁵² has to some extent incorporated the use of electronic evidence and its admissibility but there has been no significant change in light of international practices. It must be handled in a manner to secure its authenticity and integrity, since it is subject to modification or deletion.⁵³ Judiciary and law enforcement agencies should be provided with regular training in cyber forensics to enhance technical competence. Moreover, investment in state-of-the-art forensic laboratories and digital infrastructure is critical for building credibility and efficiency in digital investigations. Not only is the infrastructure essential, but there is also a need that the judges are also equipped and trained to make its best use in the trial purpose.

3. Institutionalize Victim-Centric Justice Mechanisms:

Victims often remain marginalized within the Indian criminal process, viewed largely as witnesses with limited procedural rights. To reverse this trend, a victim-centric approach must be embedded across legal and administrative systems. This includes full implementation of

⁵¹ The Digital Personal Data Protection Act, 2023.

⁵² The Bhartiya Sakshya Adhiniyam, 2023, S. 63.

⁵³ United Nations Office on Drugs and Crime, Comprehensive Study on Cybercrime, draft February, 2013, p. 157.

victim compensation schemes, establishing support services such as counseling and legal aid, and integrating restorative justice mechanisms like mediation and reconciliation in appropriate cases. Victims must also be allowed greater participatory rights in trials, particularly in cases involving serious crimes or prolonged trauma.

4. Prioritize Police and Investigative Reforms:

The quality of investigations remains a major concern in criminal justice delivery, often undermined by outdated procedures, inadequate manpower, and political interference. Comprehensive police reform is needed to professionalize the force and enhance accountability. This includes filling vacancies, ensuring periodic training in scientific investigation techniques, and introducing performance evaluation systems that prioritize ethical behavior and case outcomes over conviction rates.

Additionally, every state should establish an independent Police Complaints Authority to investigate allegations of custodial violence, illegal detention, and misuse of power. Transparent recruitment, insulation from political control, and community policing models can restore public trust and strengthen grassroots law enforcement.

5. Reform Bail Laws and Reduce Undertrial Detention:

There is a large number of undertrial prisoners most of whom have been languishing in jails for several years arising from procedural delays. Bail reform should be such that it ensures that non-violent and first-time offenders are released on pre-trial terms. Streamlining bail procedures by way of fast-track procedures, simplification of functions of sureties and use of technology in application of bail over the phone can reduce the impact on the judiciary and the prison itself.

There is need to enhance availability of legal aid services at the pre-trial level and sensitization of judicial officers on the constitutional rulings on liberty and presumption of innocence. In the end, this should aim at bringing the bail practices into resonance with the right to individual liberty in Article 21 of the Constitution⁵⁴.

⁵⁴ The Constitution of India, 1950, Art. 21.

6. Transform the Prison System into a Rehabilitative Institution:

Indian prisons are still operated within punitive colonial structures and are frequently overcrowded, lacking healthcare, and have poor infrastructure. The philosophy of the correctional system needs to shift to the rehabilitative one. This includes giving skills training, mental therapeutics, educational provisions, and coming back to the society after release.

There should also be expansion of the open prisons and community-based alternatives, especially of the low-risk offenders. Special attention and different system of care are needed in taking care of female and juvenile prisoners due to their vulnerability. Accountability and transparency in correctional institutions can be ensured by the appointment of prison monitoring boards whose members are retired judges and specialists in the field of human rights.

7. Using Technology Responsibly:

The adoption of technology in justice system such as online registration of FIRs, virtual hearings, digital evidence, and AI tools hold significant importance. However, this inclusion must be transparent and inclusive. To ensure this, digital literacy among people must be increased and infrastructure barriers be removed. Clear guidelines must be drafted for the use of AI and machine learning tools in judicial processes to prevent algorithmic discrimination and uphold due process.

8. Promote Legal and Civic Education:

For ensuring a fair criminal justice system it is important that the citizens must be empowered and made aware of their rights. Public awareness campaigns, digital literacy initiatives can be of great help in empowering the citizens to assert their rights. Also, interdisciplinary approach must be adopted in colleges and universities to reflect the system in overall manner by including technology, psychology, human rights, victimology etc.

Conclusion:

With the advent of technology, the whole idea of crime has changed. So, there is also a need for reform in the Indian criminal justice system which is both systematic and sustained. The future lies in building a justice system that is technologically advanced, socially inclusive,

procedurally fair, and constitutionally sound. All the stakeholders including policymakers, individuals, and law enforcers must work collaboratively to bridge the policy gaps and uphold the rule of law. The recent technology advancements can prove as a boon only when used in rightful manner. Otherwise, the consequences which it carries may have a devastating effect on the public trust and administration of justice. The recently enforced new criminal laws, which accept the electronic evidence can serve as a guiding light to this change. India can also look into the examples set up by other nations to bring out the changes in the current Indian framework.