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"ARTIFICIAL INTELLIGENCE AND CRIMINAL JUSTICE: INDIA'S DIRECTION FROM GLOBAL EXPERIENCES"

'युक्तिः प्रधानं कार्येषु तेजस्वी भवति जगति''

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Abstract

The incorporation of artificial intelligence has emerged as a game-changer in the global criminal justice system. This technological development not only helps in investigating monitoring and predicting crimes but is also proving to be helpful in making the judicial process and rehabilitation mechanism more efficient. Countries like the United Sates, China the United Kingdom the European Union and Russia have integrated Artificial Intelligence (AI) in the justice system at various levels while India is yet in its initial stages and is experimenting through pilot projects. While AI's potential can enhance judicial efficiency on one hand its use also raises serious ethical and legal questions such as transparency bias privacy and violation of fundamental rights. This article provides a comparative review of policies, technological tools and ethical concerns of using AI in Criminal Justice System of India and suggests how AI can be implemented in a fair transparent and human-centric manner. Perhaps the use of this technology can bring about a significant change in our judicial system. To bring in this substantial enhancement and to take it forward in a leading manner in the judicial field, we should first review various exceptions related to it, so that we can make a successful attempt to implement it in the context of Indian law. In a large country like India, despite having substantial availability of resources, we are yet to make the best use of it by channelizing the power of AI in specific domain. India's judicial system is one of the three pillars of foundation in our country and there is a frantic need to remain abreast with respect to ever emerging technology, both indigenous as well as global.

Keywords: Criminal Justice, Artificial Intelligence, Monitoring and Prediction, Fundamental Rights, Policy Frameworks, Pilot Projects, Human-Centric Approach, Judicial Reform, Technology Integration, Judicial Pillar

Introduction

Justice delayed is injustice. This proverb depicts the present state of Indian justice system where increasing number of cases and slow procedure has obstructed the right of people to justice. In recent times, science and technological advancement has presented possibilities of revival of criminal justice system in which Artificial Intelligence (AI) is playing a major role. AI is no longer confined to research laboratory but has practically become a part of almost every sector including

police surveillance, judicial decision making and effective system. The nature of crime has also changed beyond traditional boundaries to digital and cyber medium for which traditional investigation methods are becoming inadequate. AI based tools and algorithms are being used in crime prediction, suspect identification, social media analysis, judicial document review and iteration risk assessment. However, this technological revolution comes with various challenges. The most important among them is the possibility of bias in justice, violation of human rights, violation of data privacy and lack of transparency. Different political systems, legal structures and social priorities of different countries create diversity in the use of AI. In India its use is still at an initial stage whereas countries like America and China are making advanced use of AI in the justice system. The study presents a comparative analysis of international experience, tools and policies so that developing countries like India can use this technology, within their legal and constitutional framework to make justice more accessible transparent and effective.

Global Rise of Artificial Intelligence in Criminal Justice System

The introduction of Artificial Intelligence marks a transformational phase in the global criminal justice system. Over the past two decades advances in technology have made justice-related processes more accurate faster and data-driven. Countries around the world are now using AI in areas such as predicting crimes identifying suspects analysing crime patterns assisting in judicial decision-making and recidivism risk assessment. Countries such as China the United States the European Union the United Kingdom and India have integrated AI into the justice system in varying ways.

Ethical, Legal and Procedural Drawbacks

While the efficiency and capabilities of AI systems are limitless and its boundaries are difficult to be confined, the ethical and legal concerns of its usage cannot be overlooked. One of the most prominent concerns is algorithmic bias, wherein AI models may reproduce biased results based on the historical data, such as labelling certain ethnic or social groups as high risk, thereby resulting in an ambiguous and a single sided decision.

Privacy Violations

These violations are particularly linked to the use of surveillance systems and biometric data, which have become a burning topic of public concern among human rights organizations in many countries. In advanced countries, like the US and China, where AI is used to monitor human data, human rights abuses have become a common concern. For instance, in the European Union, while AI-based camera networks are being widely used in public areas, however the same is under strict monitoring and legal control of the government, to avoid its misuse. In many countries AI-based decision-making systems are being criticized due to lack of reputation and accountability. For instance, clarity regarding who would be made responsible in case an AI system/device delivers a wrong decision, is yet not defined and rather cannot be defines in isolation.

Fourth Industrial Revolution and Justice System

The Fourth Industrial Revolution also known as 4IR is a revolution in which advanced technologies such as Artificial Intelligence Machine Learning Internet of Things and Blockchain are changing our institutions from the root. This revolution is not only affecting industries and

business but is also giving a new direction to the criminal justice system. These days the judicial system is gradually moving towards digitization and automation, where judges, lawyers and police officers are using AI-based tools. Platforms such as e-courts, smart court systems, digital case management and virtual courts are part of this change. This revolution gives us an opportunity to make justice more accessible timely and fair, however simultaneously it is necessary to ensure that technology does not violate human rights transparency and accountability in the due process of law.

Artificial Intelligence Tools being Utilised in Criminal Justice System Across Various Countries

Artificial Intelligence plays and important role in the field of Criminal Justice Systems. The researcher has compiled list of leading AI tools deployed across the criminal-justice lifecycle spanning from Crime Prevention Crime Investigation Trial/Judicial Process and Corrections/Parole. This overview highlights both global innovations and India's home-grown platforms in shaping modern policing legal proceedings and offender management.

Table 4.1- AI Tools in Crime Prevention

Tool	Country of Origin	Brief Application
MARVEL (2024)[1]	India	Maharashtra Advanced Research and Vigilance for Enforcement of Reformed Laws (MARVEL) is an SPV launched to harness AI for predictive crime-pattern analysis suspect identification and strategic deployment of resources to deter offences
PredPol (2008)[2]	USA	Uses historical crime data and machine learning to forecast "hot spots" for future crimes.
Hunch Lab (2015)[3]	USA	Real-time analytics to help police decide where and when to deploy patrols based on risk scores.
ShotSpotter (2006)[4]	USA	Acoustic sensor network that detects and triangulates gunshots alerting law-enforcement in seconds.

[1] Pradeep Sharma HUMAN GEOGRAPHY: ENERGY RESOURCES (New Delhi: Discovery Publishing House 2007) ISBN 978-8183562867.
[2] Mohler G. O. et al. "RANDOMIZED CONTROLLED FIELD TRIALS OF PREDICTIVE POLICING" *Journal of the American Statistical Association* 110(512) 2015 pp. 1399–1411.
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[4]McDaniel M. et al. "EVALUATION OF SHOTSPOTTER GUNSHOT DETECTION SYSTEM IN OAKLAND" *Journal of Law Enforcement* 8(2) 2019 pp. 34–45.

Beware (2016)[5]	USA	Mines social media arrest records and commercial data to assign individual "threat scores."
AI-Based Surveillance (2019)[6]	China UK UAE	Facial-recognition and behavior-analysis platforms for crowd monitoring and public-space surveillance.

Table 4.2- AI Tools in Investigation

Tool	Country of Origin	Brief Application
CCTNS (2009)[7]	India	Crime and Criminal Tracking Network & Systems (CCTNS) created a unified online FIR-to-charge-sheet database across 15000 police stations enabling seamless data sharing analytics and real-time tracking of cases
TRINETRA (2018)[8]		An AI-driven mobile/web app for Uttar Pradesh Police that digitizes criminal records and supports face- voice- and text-based searches against a 900000-person database accelerating suspect identification during investigations
Clearview AI2019[9]	USA	Matches probe photos against a 20 billion-image database to identify suspects or witnesses.
Cellebrite UFED[10]2000	Israel	Extracts and decodes data (calls messages GPS app data) from smartphones drones SIM cards etc.
Palantir Gotham 2014[11]	USA	Integrates structured/unstructured data (police reports OSINT surveillance feeds) for link analysis.
AIRA 2022[12]	India	ML-driven crime-pattern analysis and hotspot forecasting for Hyderabad Police command center.
XRY 2003[13]	Sweden	Specialized hardware/software suite to recover live and deleted data from mobile and embedded devices.

[5] Noble S. U. "ALGORITHMS OF OPPRESSION: HOW SEARCH ENGINES REINFORCE RACISM" *New York University Press* 2018 pp. 67–89.
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[10]Cellebrite UFED ULTIMATE PRODUCT OVERVIEW 2007 www.cellebrite.com (Visited on May 26 2025).
[11] Diffie Whitfield; Susan Landau (August 2008). "Internet Eavesdropping: A Brave New World of Wiretapping". *Scientific American*. Retrieved 2009 pp.03-13.
[12]*ibid*
[13]Jones M. "DIGITAL FORENSICS TOOLS: AN OVERVIEW OF XRY AND ITS APPLICATION" *Forensic Science International: Digital Investigation* 20 2017 pp. 1–10.

Table 4.3- AI Tools for Trial / Judicial Process		
Tool	Country of Origin	Brief Application
COMPAS 1998[14]	USA	Generates recidivism-risk scores used in bail and sentencing decisions (controversial for documented racial bias).
REMA (MarIA) 2021[15]	Brazil	Drafts preliminary rulings in repetitive cases by applying precedent templates—cuts decision time from 40 min to <5 s.
ROSS Intelligence (defunct) 2021[16]	USA	NLP-based legal-research assistant (shut down in 2021 after copyright dispute).
LexisNexis & Westlaw Edge 2023[17]	Global	AI-enhanced legal-research platforms offering drafting summarization predictive analytics and quick-check tools.
SUPACE 20221[18]	India	Assists Supreme-Court judges with precedent search factual-matrix extraction and case summarization.

Table 4.4- AI Tools for Corrections / Parole		
Tool	Country of Origin	Brief Application
AI Risk Assessment Tools 2013[19]	USA UK	Statistical and ML models (e.g. OASys PCRA) to estimate individual recidivism risk for parole/release decisions.
Wearable Electronic Monitoring 2010[20]	Global	GPS/RF-enabled ankle bracelets with AI tamper-detection to monitor parolees' movements in real time.

[14]Julia Angwin et al. "MACHINE BIAS" PROPUBLICA May 2016 www.propublica.org (Visited on May 26 2025).
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[17]Ashley K. D. "ARTIFICIAL INTELLIGENCE AND LEGAL ANALYTICS: NEW TOOLS FOR LAW PRACTICE IN THE DIGITAL AGE" *Cambridge University Press* 2017.
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Prison Management AI Systems 2022[21]	Singapore UK	Sensor/camera-based behaviour-detection and predictive-analytics platforms to spot inmate distress or potential violence.

China Centralized Surveillance and Smart Courts

In China artificial intelligence is being used with a highly centralized and surveillance-based approach. Huge camera network projects like Skynet and Sharp Ice monitor public places which is a means of identifying criminals and controlling social behavior. Apart from this AI is being used in China's smart court system to review digital evidence legal research and drafting preliminary decisions. AI prosecutors are even able to file sweater charge sheets in some cases. Although this system has been helpful in increasing efficiency it has also raised serious questions like violation of privacy ignoring civil liberties and balance in opportunities for fair justice.

US algorithms for assessment and sentencing algorithms

In the United States AI is used in the criminal justice system to assess offenders and determine their likelihood of recidivism. Tools such as Compass Correctional Offering Management Profiling for Alternative Sanctions help inform sentencing and bail decisions based on the profile of offenders. Similarly algorithmic models such as the Public Safety Assessment help judicial officers make informed trial decisions. Although these tools have often been criticized for bias and lack of transparency legislation such as First Step in 2018 and the National AI Initiative Act of 2020 have provided guidelines for implementing AI in a more responsible and ethical manner.

United Kingdom UK's routine use and human monitoring

The UK has adopted AI in the criminal justice system gradually but with a clear policy where models like the Hand We Assessment Risk Tool evaluate the likelihood of reoffending which helps the police department decide on rehabilitation intervention measures. The special thing is that the priority of human judgment is maintained in these tools and efforts are made to avoid social bias. The UK's Data Protection Act 2018 and the General Data Protection Regulation (CDR) have a similar framework to ensure data protection while responding to AI. In addition, the Information Commissioner's Office monitors these systems.

EU Ethics Priority GDPR and AI Act

The European Union is the region adopting the most comprehensive strict regulatory framework in the use of AI. In the EU Act 2021 AI applications have been classified in the Risk Star Unacceptable High Medium category in which the criminal justice sector has been placed in the high-risk category as well as human rights in the use of AI tools through the General Data Protection Regulation (GDPR) and the European Ethical Chart 2018. Values such as transparency and accountability are championed. Europe's Human in the Loop approach which ensures that final decisions are made by humans provides a guide for ethical and legal human rights at a global level.

[21]Tan K. & Lee H. "AI APPLICATIONS FOR PRISON SAFETY AND INMATE MONITORING: A COMPARATIVE STUDY OF SINGAPORE AND THE UK" *Journal of Correctional Technology* 15(1) 2023 pp. 55–73.

Russia Online Justice and Judicial Automation

Russia has adopted AI as an automated tool where the online justice platform allows citizens to file documents view case status and participate in hearings via video conferencing. The service also automatically drafts procedural documents reducing the workload of judges. AI is also being used in the appointment of judges where profiling of potential candidates is done through neural networks. Although Russia's system has been successful in increasing efficiency concerns are also being raised about its excessive centralization and impact on civil liberties.

India Experiments Started and Scattered Implemented Systems

The use of AI in India is still in its infancy. Experimental tools like Marble Maharashtra Trinetra Uttar Pradesh and Super Supreme Court have been developed which aim to predict crime identify criminals and assist in judicial research. Although there have been efforts like Niti Aayog's AI strategy and Digital Data Protection Act 2023 India does not yet have any coherent and binding national law that can legally regulate the judicial use of AI. There is no dearth of resources in India but they have to be used effectively. There is a lack of strategy to use it. In such a situation India needs an ethical transparent and human-centric IT policy which is in line with its democratic and constitutional values.

Conclusion

The careful integration of advanced and sophisticated Artificial Intelligence (AI) models into criminal justice systems has the potential to reshape every stage of law enforcement including judicial process and corrections. From predictive-policing platforms and AI-driven surveillance networks in China to risk-assessment tools like COMPAS in the United States and HART in the United Kingdom these technologies seem to offer unparalleled gains in efficiency accuracy and resource allocation. The risk-based regulatory framework adopted by European Union and the Data Protection Act of United Kingdom exemplify efforts to balance innovation with fundamental rights while India’s nascent pilots and Russia’s centralized “Online Justice” platform reflect divergent governance models and priorities. However, the chapter also underscores that technological promise alone cannot guarantee justice. Persistent challenges such as algorithmic bias privacy issues and uneven regulatory landscapes have the potential to undermine fairness and public trust. No jurisdiction mechanism possesses a one-size-fits-all solution rather each innovation brings its own risks and rewards along. The concerned stakeholders must prioritize human centric oversight at every step transparent audit mechanism and high ethical standards that transcend borders.

These developments cannot happen in isolation but would fetch the desired results only when the maker and checker both come on the same page to develop the same. Through a multidisciplinary collaborative effort among technologists’ legal scholars’ policymakers and civil-society actors a nation can develop synchronised practical and transparent guidelines that can harness AI’s strengths while safeguarding due process non-discrimination and accountability. Only through

such a balanced human-centric approach can AI serve as a catalyst for a smarter swifter and more equitable criminal justice system.