

From dharma to data: transformation of criminal justice administration through artificial intelligence

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Abstract

Artificial Intelligence (AI) is a rapidly evolving technological field. Its deep integration into India's Criminal Justice Administration System marks a significant transformation of the nation's judicial framework. This paper reviews and outlines the evolutionary development of the Indian Judicial system, tracing its origins from ancient legal philosophies rooted in Dharma, through medieval jurisprudential innovations, to the contemporary data-driven transformation powered by AI. By analysing historical, legal, and technological dimensions, this paper systematically examines the primary challenges of constructing an AI-empowered legal system, including algorithmic bias, transparency issues, and accountability concerns. This article highlights advantages such as increased effectiveness, improved precision, and enhanced equity in the justice administration system. Fundamentally, this paper examines how India can adopt advanced technologies while addressing current challenges and upholding procedural justice and legal integrity.

Keywords: Artificial Intelligence, Criminal Justice, fingerprint analysis, facial recognition technology, forensic analysis.

Introduction

As Justice Oliver Wendell Holmes once noted, the life of law is found in human experience rather than logic.³ This perspective has significant implications in the evolution of India's criminal justice system and its adaptation of Artificial intelligence to deal with contemporary challenges. India's criminal justice framework is designed not only to punish wrongdoers and to uphold the rule of law but also to maintain social order balanced with protecting individual rights and safety.⁴ This system comprises an interconnected structure involving the legislature, executive and judiciary, each entrusted with law-making, enforcement, adjudication and rehabilitation⁵ respectively.

The Socioeconomic and political dynamics of each historical era have significantly shaped the objectives and practices of criminal justice in India⁶. As societal demands evolved, the

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³ Abadin, R. A. (2016, January 1). "The life of the law has not been logic; it has been experience." Florida Bar Journal, 90(1), 6. Retrieved from <https://www.thefreelibrary.com/%22The+life+of+the+law+has+not+been+logic%3b+it+has+been+experience%22.-a0495208696>

⁴ Kumar, A. (2024). The Constitution of India and the criminal justice administration: A judicial perspective. International Journal of Advanced Legal Research, 4(3). Retrieved from <https://ijalr.in/volume-4-issue-3/the-constitution-of-india-and-the-criminal-justice-administration-a-judicial-perspective-aakash-kumar/>

⁵ Shaw-Parker, B. (2023, October 19). Criminal justice system: Legal definition, arraignment, trial, sentencing and appeals. Juristopedia. <https://juristopedia.com/criminal-justice-system-legal-definition/>

⁶ Tripathi, R. (2018). Evolution of criminal justice system in ancient India. International Journal of Multidisciplinary Research and Development, 5(1), 153–157.

goals and operational procedures of administrative system also underwent a profound transformation. As a result, it was the need of each period to introduce innovative mechanisms and methods for the enforcement of law and justice administration. This article offers almost reflective examination of how slowly evolved India's criminal justice system over time, while also turning attention to the growing presence of artificial intelligence at different points of this path. Rather than considering these developments as separate, the discussion moves back and forth across periods, showing how legal systems tend to adjust sometimes awkwardly, to shifting social needs and emerging technologies.

The Indian justice system is, in principle grounded in fairness, justice, and equality. However, translating these constitutional ideals into everyday courtroom practice has never been entirely smooth. Delays in the disposal of cases continue to trouble the system the familiar saying "justice delayed is justice denied" no longer feels like a mere phrase, it feels uncomfortably real. These delays raise serious questions about the right to a fair trial, reminding us that justice, when it arrives too late, often loses much of its meaning, and somewhere along the way, the human is usually borne in silence. The two most important issues in this regard are judicial backlogs and limited resources. This issue seriously hinders the efficient administration of justice.

The term artificial intelligence, first articulated in the mid-twentieth century, refers to the creation of a system which has the ability to simulate human cognitive functions such as reasoning, learning and decision making. John McCarthy, a pioneer in this field, elaborates it as the effort to create machines that have intelligent behaviour.⁷ Artificial Intelligence (AI) denotes machines that can independently perceive and engage with their surroundings, performing tasks traditionally demanding human intellect and decision making without direct human interaction.⁸ The AI enabled justice administration promotes effective, equitable, and efficient mechanisms.⁹

Objectives of the study

- To make a comparative study of how India's criminal Justice administration has strengthened over time.
- To examine the benefits and challenges associated with the use of artificial Intelligence in Criminal Justice.

Criminal justice system in India: Historical overview

In the close look at the roots of India's criminal justice system, it quickly becomes clear that

⁷ Manning, C. (2020). Artificial Intelligence definitions. Stanford University. <https://hai.stanford.edu/sites/default/files/2020-09/AI-Definitions-HAI.pdf>

⁸ Saini, N. (2023). Research paper on artificial intelligence & its applications. International Journal for Research Trends and Innovation, 8(4), 356-360. <https://ijrti.org/papers/IJRTI2304061.pdf>

⁹ Ministry of Law and Justice. (2025, February 25). Digital transformation of justice: Integrating AI in India's judiciary and law enforcement [Press release]. PIB. <https://static.pib.gov.in/WriteReadData/specificdocs/documents/2025/feb/doc2025225508901.pdf>

law here did not begin as a rigid set of rules enforced by the state. Instead, it grew out of the idea of Dharma. The concept of Dharma not only dealt with punishment or the exercise of authority, rather, it was about keeping society together. According to ancient Indian texts, Dharma is not as law in the modern sense, but it was treated as a moral guide that directed how people were expected to live with one another. It was less about written rules and more about shared values that helped to maintain social harmony.

Another concept closely related to Dharma is Karma. According to this concept, every action has consequences. The belief was that the wrongdoing would gradually disturb social balance and invite accountability. This way of thinking laid the foundation for responsibility even before formal legal systems developed. Modern legal systems reflect this idea by converting moral responsibility into enforceable rules, punishments, and deterrence. Dharma is founded on the core principles of honesty, compassion, self-control, and purity of conduct. They influence everyday life such as behaviour of people, exercise of power, administration of justice. These values were worked quietly without even a constant explanation. Every individual believed to have specific role or duty, this duty is known as *Svadharmā*. Fulfilment of *Svadharmā* was seen essential for maintaining social balance. Even though such ideas may not appear ideal in today's world as it is closely tied to rigid social hierarchies, it reflected an effort to place duties before personal claims.

Ancient Indian legal thought also founded on the idea of *rita*. It referred to a moral order governing both natural and human life. According to this, law was not created at will but it was discovered through moral understanding. law was understood as existing within larger cosmic and moral order, rather than as something separate from it. This approach stands in contrast to modern approach. when ancient Indian approaches are duty- centred modern approaches are right -centric. Even then both are not completely opposed. As rightly pointed out by Leon Duguit, when a system based on duty, right of its individuals are automatically ensured. When people realise their responsibilities toward others, shared rights began to take shape. But in the society where powers are unequal, this idea has limits. It offers different way of thinking about justice.

In India, law has been shaped by this broader understanding of dharma. it is not considered as a mere set of rules rather as a way of life. It does not confine itself to legal obligation alone instead it encompasses moral conduct and social responsibility. In practice dharma tried to hold law, morality and human behaviour together with larger sense of order. Like an unspoken rhythm, it helped keep society from falling apart. In contrast, the modern legal system has prioritized fundamental rights, emphasizing a right-based society.¹⁰ Texts such as *Manu Smriti*, *Narada Smriti* and *Artha Sastra* offer crucial insights into the inherent link between justice administration and the idea of Dharma. These texts illustrate the king's and ruler's duty to safeguard Dharma, thereby upholding social order.¹¹ The traditional Hindu

¹⁰Kumar, S., & Gaur, K. S. 2023. Right to privacy in India. *International Journal of Law*, 9(1), 169–175.

¹¹ Mallikarjun, G., & Irfan, B. Md. (2022). Right to privacy in India: The technical and legal framework. *Journal of Positive School Psychology*, 6(3), 5785–5790.

legal system was founded upon the principle of Dharma. It faced considerable pressure and lost prominence with the onset of colonial rule and the introduction of western legal system, leading to an era where Dharma's traditional role in Indian law significantly diminished.

Even then we can see in the modern legal system, the basic principles of dharma in every aspect. Dharma has a secular character, unites all men and overcomes all religious and social barriers. This specific aspect of dharma is similar to the modern idea of social justice. Dharma's applicability in the contemporary context is based on its proactive prevention instead of Solely punitive approach. It gives the norms of social living and promotes coexistence of social organisations. Even today, the philosophy of dharma can be seen influencing the legal system and social norms with justice closely linked to the ideas of righteousness, duty and morality as fundamental tenets of justice.

By the late of eleventh century, Hindu rule in India had begun to decline. Hindu kings were successfully invaded and dethroned by foreign Turkish conquerors.¹² At that time most Hindu countries were almost always at war and seldom at peace. Any concerted political activity against common enemies was foiled by an intense atmosphere of distrust among these governments. The caste system already established severely undermined the Hindu monarchy.

Throughout Indian history, the judicial system has often reflected the dominant ideas of the time. In ancient India, courts played an important role in upholding dharma as the guiding principle of justice. Similarly, during the medieval period, especially under Mughal rule, the system of justice was influenced by Islamic principles, and people were treated according to the religious norms prevailing then.¹³ The British colonial ruler later used the judicial system as a tool to maintain and strengthen their control over India. The Indian criminal justice system has undergone numerous changes in its enforcement mechanisms, often exhibiting patriarchal tendencies evident in Buddhist, Islamic and colonial laws¹⁴. Today, the legal system is more organised, but getting justice is still expensive and slow for ordinary people. Many people find it hard to go to court because of high costs and long delays., pursuing a legal remedy is difficult due to expenses and delays. On the other hand, people with wealth and influence often find it easier to secure justice. This indicates that the legal system, whether deliberately or otherwise, places greater burdens on the poor.¹⁵ It worked as a check on strict social systems and brought gradual change. Overtime, dharma moved from being a moral ideal to a practical arrangement, and later became part of formal law. Its lasting

¹² Ancient-Origins. (n.d.). Sena Empire. Retrieved from <https://www.ancient-origins.net/history-famous-people/sena-empire-0016707>

¹³The Judicial System in Ancient India: Examination Regarding Hierarchy and Integrity. (n.d.). Retrieved from <https://cnlu.ac.in/wp-content/uploads/2025/05/The-Judicial-System-In-Ancient-India-Examination-Regarding-Hierarchy-And-Integrity-by-Mr.-Amit-Pandey-Dr.-Swapnil-Pandey.p>

¹⁴ Ahmad, M. B. (1941). The administration of justice in medieval India. The Aligarh University. <https://archive.org/details/in.ernet.dli.2015.21933>

¹⁵Olivelle, P. (Ed. & Trans.). (2000). Dharmasūtras: The law codes of Āpastamba, Gautama, Baudhāyana, and Vasiṣṭha: Sources of ancient Indian law (Reprint). Motilal Banarsidass Publishers.

importance lies in its focus on preventing wrongdoing rather than only punishing it, which keeps it relevant even today.

The Vyyavaharic rules were meant to create an orderly social system. They governed relations between different groups, supported existing power and property arrangements, recognized the state as a legal authority, and allowed religious institutions to frame and follow their own rules.¹⁶ Its real strength lies not so much in punishment, but in its ability to prevent harm before it happens, and that is what makes it still relevant even today. The vyavaharic rules were meant to shape life outside the individual, by guiding how different groups interacted with one another, keeping certain power and property arrangements stable, and acknowledging the state as a legal authority in its own right. At the same time, they left space for religious institutions to grow and manage their own internal rules, allowing them a degree of independence without breaking the broader social order.¹⁷ Similarly, Shastric concepts of law outlined behavioural rules that were to be interpreted alongside religious injunctions. Moreover, Dharma is inherently secular, explaining human existence within humanity itself and thereby unifying diverse individuals.

Examining the shift in Indian society from a Dharma-centric to a data-driven framework reveals the prevalent belief that AI will inevitably dominate human life. Significant technological advancement, particularly in artificial intelligence, has altered many aspects of daily life. The AI-enabled justice administration has resulted in significant transformations. Artificial intelligence and widespread use of smartphones show how deeply technology has become part of everyday life. In this context, it is important to examine how AI is likely to reshape India's criminal justice system in the coming years.

The consequences of adverse results include wrongful arrest. The application of AI-powered biometric identification has led to significant changes in the realm of justice administration. While AI carries serious risks also. One such consequence is the possibility of wrongful arrests¹⁸. In areas like identification and surveillance, AI has wide existing and future applications. These include facial and fingerprint recognition, tracking vehicle number plates, and detecting gunshots. Although these technologies can perform better than human observation in many situations, they also raise serious concerns about errors, bias, and violations of privacy.

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¹⁶ Mees, G. H. (1986). *Dharma and Society*. Gyan Publishing House.

¹⁷ Dhavan, R. (1992). *Dharmasastra and modern Indian society: A preliminary exploration*. *Journal of the Indian Law Institute*, 34(4), 523–542.

¹⁸ Covington & Burling LLP. (2024, October). OMB releases requirements for responsible AI procurement by federal agencies. *Insights*. Retrieved from <https://www.cov.com/en/news-and-insights/insights/2024/10/omb-releases-requirements-for-responsible-ai-procurement-by-federal-agencies>

situations, they also raise serious concerns about errors, bias, and violations of privacy.¹⁹ These tools outperform human observation but raise concern over errors, biases and privacy violations.

Biometrics

The integration of AI in fingerprint analysis is one of the major technological advances. It uses machine learning and advanced automation to help achieve more accurate and efficient forensic investigation. This new biometric approach begins a new phase in pattern recognition and data interpretation.²⁰ The system is able to quickly analyse complicated information and thereby help the forensic experts to prove even difficult cases. It also provides detailed reports and images that are very useful for analysis. Pattern recognition algorithms are crucial for comparing and matching fingerprints. AI enhances the accuracy and speed of the identification process, by carefully examining minute details like ridge patterns and specific points, allowing a thorough analysis.²¹

Facial Recognition Technology (FRT) is widely used to compare faces in images or videos.²² FRT creates digital templates and uses one to many and one to one method²³. Though effective, it raises privacy, bias and accuracy issues. Iris scanning technology can identify individuals by the unique, donut-shaped tissue patterns surrounding the pupil of their eye.²⁴ This method is highly reliable because iris patterns are distinct, protected from corneal damage, and remain constant over time. Compared to face recognition technology, iris scanning is a more recent development.²⁵ AI enhances forensic accuracy. Machine learning supports DNA comparisons, drug tracing, and electronic evidence analysis. It shifts forensic practices from subjective to objective approaches, reducing human bias and building public trust.

The time and expenses associated with the examination of process are reduced with the advent of AI-enabled forensic analysis. The careful validation of analytical methods is a key responsibility of forensic scientists. This facilitates easier analysis of the precision and reliability of forensic methods. It is also helpful in explaining the results using concepts like

¹⁹ Department of Justice, India. (n.d.). Annual reports. Retrieved from <https://doj.gov.in/annual-reports>

²⁰ Ali, M. M. H., Mahale, V. H., Yannawar, P. L., & Gaikwad, A. T. (2018). A review: Palmprint recognition process and techniques. *International Journal of Applied Engineering Research*, 13(10), 7499–7507. http://www.ripublication.com/ijaer18/ijaerv13n10_37.pdf

²¹ Kumar, R., Bhartiya, V. P., Singh, D., Rathoriya, P., & Sahu, J. (2021). Palm print recognition and authentication using digital image processing. *International Journal of Creative Research Thoughts*, 9(12). <https://ijcrt.org/papers/IJCRT2112151.pdf>

²² National Institute of Standards and Technology. (n.d.). Face Technology Evaluations (FRT-FATE). Retrieved from <https://www.nist.gov/programs-projects/face-technology-evaluations-frtefate>

²³ National Institute of Standards and Technology. (n.d.). Face Technology Evaluations (FRTE/FATE). Retrieved from <https://www.nist.gov/programs-projects/face-technology-evaluations-frtefate>

²⁴ NEC Corporation. (n.d.). Iris biometrics solutions. Retrieved from <https://www.nec.com/en/global/solutions/biometrics/iris/index.html>

²⁵ Leidos. (n.d.). Next-generation identification (NGI). Retrieved from <https://www.leidos.com/capabilities/integrated-systems/biometrics/next-generation-identification-ng>

random events or probability errors. However, forensic science powered by AI presents challenges to this validation process. AI models are working with large databases. There may be significant differences between the data they were trained on and the data they encounter in real world situations, such as techniques employed to collect and organize evidence.

Due to its intricate and proprietary nature of AI systems, it is very difficult to confirm that they are working as they are programmed. These challenges demonstrate how important it is to adhere to ethical standards during the development, testing and reassessing AI-enabled analytical methods in forensic investigation. Forensic scientists have the obligation to clearly explain the data, methods, and conclusions of their analysis. The complexity of AI models along with their capacity to learn from hidden correlations, may make it more challenging to explain forensic processes involving AI.

Additionally, professional human supervision remains crucial in forensic science. AI should support human judgement rather than replacing it by suggesting next steps, validating human analysis proving a basis for expert conclusion. The integration of AI into forensic analysis has been limited because of the complexity of forensic science, strict evidence admissibility standards and lack of high-quality data. Consequently, the application of AI in forensic analysis remains restricted under present circumstances. However, the use of AI -enabled biometric analysis to generate possible matches for further investigation is widely accepted. AI enabled probabilistic genotyping supports the analysis of complex DNA mixtures, particularly when only small amounts of DNA are available. Forensic genetic genealogy applies statistical models to compare DNA profiles with extensive databases in order to estimate biological relationships.

AI-enabled narcotic tracing is another key area where AI has placed its dominance and AI powered digital and multimedia forensic tools have also used technology widely. Examiners are using computer vision to locate particular content in vast photo and video archives. In order to find pertinent files and communications, natural language processes can also be utilized. AI enabled technology is also useful for identifying and analysing evidence created or modified by AI technology. These digital and multimedia tools currently support investigative stages in a preliminary way, rather than replacing expert judgement given in the court.

The incorporation of Artificial Intelligence (AI) into criminal investigation offers an unparalleled opportunity to significantly enhance law enforcement capabilities, particularly within the evolving framework of Bharatiya Nyaya Sanhita (BNS). These recommendations aim to ensure that AI is deployed effectively, accountably and with complete adherence to India's dynamic legal and regulatory standards.

Suggestions and Recommendations

These suggestions and recommendations are intended to ensure the use of artificial intelligence in a criminal justice system is fair, lawful and responsible. They also aim to ensure that the integration of AI into criminal justice administration follows India's existing legal and constitutional values. The object of providing these suggestions is to improve investigation methods without compromising privacy, impartiality or the protection of personal data, while keeping pace with global development.

1. Framing a clear legal framework for the use of AI in Criminal investigation

There is an urgent need to have a clear legal framework which explain how and when AI tools can be used by the police and investigating agencies. At present, no specific law directly addresses these issues.

Recommendations

- New legal provisions should be included in the criminal laws to specifically deal with the use of AI -enabled tools in digital forensic, evidence collection, and data analysis during investigation.
- Clear rules should be made to explain how courts can accept evidence prepared with the help of AI, and to ensure that such evidence meets existing legal standards and does not weaken the rights of the accused.
- Detailed regulation should be introduced to ensure that AI tools are used in a fair and ethical manner and that the privacy, dignity and basic human rights of individuals are respected when such tools are used by law enforcement agencies. while being used by law enforcement agencies.

2. Create National Guidelines for privacy and Data Security in AI -enabled investigations.

The use of AI in cybercrime investigations involves collection usage and storage of large amounts of digital information. Clear national rules to protect privacy of citizens while allowing police to conduct effective investigation. These guidelines must be in line with the Digital Personal data Protection Act of 2023.

Recommendations:

- Enforce strict rules to ensure that only necessary information is collected during investigation., and that personal details are removed or hidden wherever possible to protect individual privacy.
- Clear guidelines must be provided to ensure privacy by using measures such as encryption, secured storage and access control, to ensure personal information is used only in a lawful and responsible manner

3. Algorithmic Transparency

An AI enabled criminal justice system must be fair and easy to understand. AI – enabled facial recognition, predictive policing and behaviour analysis may lead to biased outcome. Therefore, fairness and transparency are important to secure public trust.

Recommendations:

- AI systems should be checked regularly and to a have proper impact assessments to find the hidden biased elements that may lead to unfair treatment.

- AI should be trained using truly representative data so that decisions are balanced and do not harm any particular group

4. Ensure Public and Judicial oversight of AI Tool

The incorporation of AI-enabled tools in criminal investigations, it has to be ensured that AI tools are subjected to rigorous oversight from public and judicial bodies. Public scrutiny will be helpful for improving transparency and accountability. In the same way judicial oversight will be helpful to ensure AI tools are used lawfully and does not violate human rights.

Recommendations:

- An independent committee including technological experts, should monitor how AI tools are used in criminal investigations and ensure they are used ethically and according to law.
- Judicial authorities should be trained to understand AI so that they can properly examine whether AI-generated evidence is fair and legally acceptable.
- Clear and effective system should be created so that the public can question, review, and hold authorities accountable for the use of AI.
- Promote international corporation in AI enabled cybercrime investigations. Cybercrimes do not stop at national borders. An online crime committed in one country can affect people in many other countries. Therefore, no single country can stop them alone, to catch these kinds of criminal's nations must work together as one global team.

Recommendations:

- Countries should agree on common rules for using AI in cybercrime investigations. These rules should ensure that digital evidence is collected in a fair manner. It also makes sure that individuals' private data stays safe.
- international organisations should work together to share information about cyber-criminals. Creating a shared databases can help to track criminals and ensure entire internet safer for everyone.

Conclusion

The journey of the criminal justice system has travelled a long way - from the ancient concept of Dharma to the AI era controlled by data marks a major change. The use of Artificial Intelligence in criminal justice administration marks an important new stage in this journey. that offers solutions to long-standing challenges in the criminal justice system, and support the goal of fair and timely justice. This paper explains how AI technologies, such as advanced biometric identification, forensic analysis, predictive policing, and risk assessment, can assist police and courts in their work. However, the future of an AI enabled criminal Justice System is not free from challenges. The paper discusses the major challenges such as biased algorithms, lack of transparency, threat to privacy and the question about accountability. Therefore, the future of AI enabled criminal justice systems in India needs a balanced approach. Technological development, ethical standards and human rights must go hand in hand. When carefully regulated and responsibly implied AI enabled criminal justice

system promises true reshaping of India's criminal justice system. It is obvious that while the tools of justice evolve, its fundamental spirit of fairness and integrity remains unyielding.

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