



Tackling Rising Crime in India: The Need for Smart and Tech-Enabled Policing

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Abstract

India's escalating crime rates, driven by both traditional and emerging offenses like cybercrime and financial fraud, underscore the urgent need for modernized policing. Traditional law enforcement mechanisms are increasingly strained by population growth, digital expansion, and jurisdictional complexity. Smart and technology-enabled policing offers a transformative solution by integrating tools like AI-based predictive analytics, surveillance systems, and digital case management. Initiatives such as CCTNS (Crime and Criminal Tracking Network & Systems) and command-control centres have already demonstrated improved coordination and responsiveness. However, bridging the urban-rural digital divide and upskilling personnel remain critical. The study examines the trends and patterns in total crime rates and cybercrime rates in India over the past decade and assesses the effectiveness of smart and technology-enabled policing tools such as CCTV surveillance, CCTNS, predictive policing, and digital forensics in enhancing law enforcement capabilities. Using trend analysis and correlation analysis the results show that there are rising trends in crime rates in India and its states. Further, it is seen that there are positive correlation between number of registered cybercrime and number of arrested cybercrime and conviction rates. To combat the rising trend of crime, the study recommends the necessity of a robust legal framework must complement these advancements to ensure ethical, effective, and accountable policing in India.

Keywords: *Tech-enabled policing, Crime prevention technologies, AI-based predictive analytics, Cognisable Crimes, Cybercrime, Crime and Criminal Tracking Network & Systems*

1. Introduction

In recent years, India has witnessed a steady rise in reported crimes, reflecting both improved reporting mechanisms and the increasing complexity of modern-day offenses. According to the National Crime Records Bureau (NCRB), over 51.5 lakh cognizable crimes were registered across the country in 2019 alone, up from 48.3 lakh in 2016. This upward trend spans a broad spectrum of criminal activities, including violent crimes, cybercrimes, financial frauds, and offenses against women and children. As the socio-economic and technological landscape of India evolves, conventional policing methods are proving inadequate to meet the demands of public safety and justice delivery. It is in this context that smart and technology-enabled policing emerges not merely as an option but as an urgent necessity.

Traditional crimes such as theft, assault, and murder remain persistent, especially in high-density urban and rural areas. However, the emergence of cybercrime, financial fraud, organized syndicates, and digital harassment has added a new dimension to law enforcement. These crimes often transcend geographical boundaries, operate through encrypted platforms, and require digital expertise to detect and prosecute. Additionally, the increase in population, urbanization, and the expansion of digital

networks have resulted in greater strain on limited police resources, leading to slower response times, lower conviction rates, and growing public dissatisfaction.

2. Objectives of the Study

1. To examine the trends and patterns in total crime rates and cybercrime rates in India over the past decade
2. To assess the effectiveness of smart and technology-enabled policing tools such as CCTV surveillance, CCTNS, predictive policing, and digital forensics in enhancing law enforcement capabilities.
3. To identify the challenges and gaps in the implementation of tech-based policing strategies

3. Data and Methodology

This study adopts a mixed-methods approach, combining both quantitative and qualitative techniques. Analysis of crime statistics published by the National Crime Records Bureau (NCRB) from 2010 to 2023. Review of government reports, policy documents, and white papers related to policing reforms and technology adoption. The Crime growth and Crime Rates are calculated using the following formulas.

$$\text{Growth (\%)} = \frac{(\text{Crimes in 2019} - \text{Crimes in 2016})}{\text{Crimes in 2016}} \times 100$$

$$\text{Crime Rate} = \frac{(\text{Total Cognisable Crimes})}{\text{Total Population}} \times 100,000$$

The correlation analysis between registered cybercrime and number of arrested cybercrime and conviction rates is done using the Pearson's product moment formula which is-

$$R_{xy} = \text{COV}(x, y) / \text{SD}_x \cdot \text{SD}_y$$

The significance of the R_{xy} is tested by the t statistics as-

$$t = R_{xy} * \sqrt{(n - 2) / (1 - R_{xy}^2)}$$

4. Review of Literature

On foundational framework of smart policing in India

Chandrashekar and Devarmani (2023) provide a strategic overview of smart policing in India using a SWOC (Strengths, Weaknesses, Opportunities, Challenges) framework. The study emphasizes how technologies like CCTNS and GIS mapping are improving crime tracking and response efficiency. It highlights the importance of institutional reforms and workforce training to bridge implementation gaps across diverse policing environments.

On the promise of AI in Indian policing

Nath and Barman (2024) explore the evolving role of artificial intelligence in Indian policing, particularly in predictive analytics and automated surveillance. The paper outlines the ethical challenges and social perceptions associated with AI, and suggests a roadmap for responsible and inclusive implementation across police departments.

On predictive policing: A meta-analytical perspective

Mandalapu et al. (2023) conduct a comprehensive review of over 150 studies to assess the effectiveness of machine learning and deep learning algorithms in crime prediction. Their analysis

identifies key techniques, commonly used datasets, and outlines future research priorities in the predictive policing domain.

On AI for vehicle surveillance and crime detection

Kadambari and Nimmalapudi (2020) develop an AI-driven surveillance system designed to detect stolen and suspicious vehicles using real-time CCTV footage. Achieving an accuracy rate of 87%, their study highlights the potential of deep learning models in reducing auto-related crimes in urban environments.

On police engagement on social media

Sachdeva and Kumaraguru (2014) analyze how Indian police departments utilize social media platforms to communicate with citizens. Based on interviews and surveys, the paper identifies challenges such as misinformation and resource limitations, while stressing the value of trust-building and community interaction in digital spaces.

On cybercrime and IoT security challenges

Rani et al. (2020) offer a detailed survey on IoT-related cyber threats, focusing on vulnerabilities that law enforcement must monitor. The study explores the integration of AI and blockchain technologies into forensic practices, reinforcing the need for innovation in tackling next-generation cybercrime.

On typologies and preventive measures for cybercrime

Singh (2025) presents a classification of major cybercrime types affecting Indian society, ranging from online fraud to digital harassment. The study proposes legal reforms, technological innovation, and awareness programs as crucial tools in the national cybercrime prevention strategy.

On state-level approaches to cybercrime mitigation

Attri, Jaiswal, and colleagues (2025) examine the efforts of six Indian state police departments in combating cybercrime. Their case-based approach outlines best practices in inter-agency collaboration and stresses the need for a uniform technology adoption policy across states.

On legal framework for police handling of cybercrime

Singh and Ali (2025) critically assess how Indian law enforcement navigates the legal and institutional limitations in handling cybercrime. The paper calls for judicial updates, specialized cyber units, and better international cooperation mechanisms to strengthen the overall response.

On surveillance, AI, and digital policing ethics

Ganguli (2025) investigates the implications of using AI and machine learning for social media surveillance in digital policing. While such tools enable proactive crime monitoring, the study warns about risks to privacy and civil liberties, and calls for a regulated framework for ethical use. Technology, when systematically integrated into policing systems, can act as a force multiplier. Surveillance technologies such as CCTV networks, automatic number plate recognition (ANPR), drones, and facial recognition systems can significantly enhance the real-time monitoring of public spaces and sensitive areas. These tools help deter crimes and provide critical evidence during investigations.

The Crime and Criminal Tracking Network & Systems (CCTNS), a national platform that digitizes FIRs, criminal records, and case progress, has begun to improve inter-state coordination and efficiency. Similarly, predictive policing tools powered by artificial intelligence (AI) and big data analytics can analyze historical crime data to forecast potential hotspots and patterns, allowing law enforcement agencies to pre-empt incidents through the strategic deployment of personnel.

In cities like Hyderabad and Delhi, integrated command and control centres with GIS mapping and real-time feeds have shown positive outcomes in managing emergencies, protests, and large public

events. These centres consolidate surveillance, communication, and incident response under one roof, thereby improving coordination and decision-making.

For enhancing investigations and accountability, modern forensic tools such as Automated Fingerprint Identification Systems (AFIS), DNA profiling, and digital forensics have made criminal investigations faster and more accurate. Digital case diaries and mobile forensic vans reduce delays in evidence collection and increase conviction rates. Additionally, body-worn cameras, GPS tracking of police patrols, and online complaint portals contribute to greater accountability and transparency in policing, minimizing the risk of custodial misconduct and improving citizen trust.

Bridging the Urban-Rural Divide

One of the critical challenges in Indian policing is the disparity in access to technology between metropolitan cities and rural areas. While urban police units are increasingly adopting advanced technologies, many rural and semi-urban police stations still rely on paper-based processes and outdated communication systems. Bridging this divide requires investment in infrastructure, training, and local innovation, tailored to the needs of different regions.

Capacity Building and Policy Support

Technology is only as effective as the people who operate it. Therefore, regular training programs, e-learning modules, and virtual reality-based simulation exercises are essential for improving the digital skills of police personnel. State police academies and national institutions like the Bureau of Police Research and Development (BPR&D) must revise curricula to include digital investigation techniques, cyber laws, and ethical use of surveillance tools.

Moreover, the push for smart policing must be supported by strong legal and policy frameworks. Data privacy laws, ethical standards for AI use, and accountability mechanisms must be in place to prevent misuse and ensure public trust.

5. Results and Analysis

An overview of Crimes in India

Cognisable crimes: The information related to decennial cognisable crimes in India is given in Table 1.

Table 1: Cognisable crimes

Year	Total Cognisable Crimes	Population (Million)	Crime Rate
1953	6,01,964	361.0	160
1963	6,58,830	458.9	143.5
1973	10,77,181	573.4	187.9
1983	13,49,866	720.4	187.4
1993	54,33,574	883.8	184.4
2003	54,94,814	1,068.2	514.4
2013	66,40,378	1,228.7	540.4
2023	58,24,946	1,379.7	422.2

Source: NCRB Annual Reports

India's crime data over the past seven decades reveals notable fluctuations in both the number of cognisable crimes and the crime rate relative to population growth. In 1953, India recorded around 6 lakh cases with a crime rate of 160 per lakh population. Despite a rising population, the crime rate dropped in the following two decades, falling to 143.5 in 1963 and only slightly increasing to 187.9 in 1973. This suggests underreporting or limitations in law enforcement capacity during the early post-independence years.

A significant shift appears between 1993 and 2003. While the total crimes in 1993 stood at 54.3 lakh with a crime rate of 184.4, it jumped sharply to 54.9 lakh in 2003, but more strikingly, the crime rate surged to 514.4, nearly a threefold increase. This sharp rise may be attributed to improved reporting mechanisms, better awareness, and expansion of legal definitions of crimes.

By 2013, both figures continued to rise, reaching 66.4 lakh total crimes and a peak crime rate of 540.4. However, in 2023, although the population increased further, total crimes declined to 58.2 lakh, and the crime rate fell to 422.2. This decline may reflect better preventive policing, use of technology, or changes in crime classification or reporting trends.

Suggestions:

Invest in preventive and predictive policing using AI, surveillance, and data analytics to identify and address crime hotspots proactively.

Improve police-public trust through transparency tools like body cameras and grievance redressal platforms, which may also improve crime reporting accuracy.

Address root causes such as unemployment, substance abuse, and lack of youth engagement, which often correlate with crime trends.

Continuously monitor and analyze trends to adapt strategies in real-time, rather than relying on decade-long aggregates.

Number of Cyber Cases Registered: Table 2 provides information number of cybercrime cases registered.

Table 2: Number of cybercrime cases registered

State	2016	2017	2018	2019	% of Share of State	Crime rate in 2019
India	4831515	5007044	5074635	5156172	100.0	385.5
Uttar Pradesh	494025	600082	585157	628578	12.2	278.2
Maharashtra	430866	467753	515674	509443	9.9	415.8
Tamil Nadu	467369	420876	499188	455094	8.8	600.3
Kerala	707870	653500	512167	453083	8.8	1287.7
Gujarat	435422	334799	393194	431066	8.4	631.6
Madhya Pradesh	365154	379682	405129	395619	7.7	478.9
Delhi	216920	244714	262612	316261	5.2	1586.1
Rajasthan	251147	245553	250546	304394	5.9	392.3
Bihar	189696	236055	262815	269109	5.2	224.0
Haryana	143111	224816	191229	166336	3.2	577.4
Karnataka	179479	184063	163416	163691	3.2	248.1
Andhra Pradesh	129389	148002	144703	145751	2.8	278.6
Telangana	120273	133197	126858	131254	2.5	352.0
Assam	107014	109952	120572	123783	2.6	385.8
Odisha	103565	103866	107408	121525	2.4	277.9
Chhattisgarh	84192	90516	98233	96561	1.9	334.7
Punjab	57739	70673	70318	72855	1.4	243.3
Jharkhand	47817	52664	55664	62206	1.2	165.5
Uttarakhand	16074	28861	34715	28268	0.5	252.8
Jammu and Kashmir	26624	25608	27276	25408	0.5	187.8
Himachal Pradesh	17249	17796	19594	19924	0.4	272.4
Tripura	4081	4238	6078	5988	0.1	149.6
Chandigarh	4256	5462	5967	4518	0.1	381.6
Andaman and Nicobar Islands	2491	3014	3699	4034	0.1	1013.6
Puducherry	4885	4799	4674	4004	0.1	264.3
Meghalaya	3582	3952	3482	3897	0.1	120.6
Goa	3706	3943	3884	3727	0.1	241.5

Manipur	4098	4250	3781	3661	0.1	117.7
Mizoram	2800	2738	2351	2880	0.1	241.0
Arunachal Pradesh	2700	2746	2817	2877	0.1	190.9
Nagaland	1908	1553	1775	1661	0.0	77.1
Sikkim	1020	979	869	821	0.0	123.5
Daman and Diu	287	382	334	370	0.0	87.5

Source: NCRB Annual Reports

An analysis of crime statistics across Indian states between 2016 and 2019 reveals significant trends in both the magnitude and regional distribution of reported offenses. At the national level, the total number of registered cognizable crimes rose from 48.3 lakh in 2016 to 51.5 lakh in 2019, indicating a steady escalation in criminal activity. This rise reflects the increasing pressures faced by law enforcement agencies in the context of rapid urbanization and digital transformation. Uttar Pradesh consistently topped the list in terms of absolute crime numbers, reporting more than 6.28 lakh cases in 2019, amounting to 12.2% of the country's total. Maharashtra and Tamil Nadu followed closely, contributing approximately 10% and 9% respectively to the national figures.

Kerala, despite registering fewer cases (4.53 lakh in 2019), reported the highest crime rate in the country at 1287.7 per lakh population, which may indicate either a robust reporting system or the inclusion of a higher proportion of minor infractions. Delhi, with its smaller population base and compact geography, recorded the highest crime rate at 1586.1, reflecting challenges common to densely populated urban areas such as anonymity, high mobility, and complex policing demands.

Crime Growth

The Crime growth for each state over the period 2016 to 2019 is calculated using the following formula. $\text{Growth (\%)} = \frac{(\text{Crimes in 2019} - \text{Crimes in 2016})}{\text{Crimes in 2016}} \times 100$

Following the above growth calculating formula, Table 3 presents the growth rates of crime from 2016 to 2019 across leading states in this regard.

Table 3: Crime growth of top ten states

Rank	State	2016	2019	Growth (%)	Share (%)	Crime Rate (2019)
1	Uttar Pradesh	494,025	628,578	27.3%	12.2	278.2
2	Maharashtra	430,866	509,443	18.2%	9.9	415.8
3	Tamil Nadu	467,369	455,094	-2.6%	8.8	600.3
4	Kerala	707,870	453,083	-36.0%	8.8	1287.7
5	Gujarat	435,422	431,066	-1.0%	8.4	631.6
6	Madhya Pradesh	365,154	395,619	8.3%	7.7	478.9
7	Delhi	216,920	316,261	45.8%	5.2	1586.1
8	Rajasthan	251,147	304,394	21.2%	5.9	392.3
9	Bihar	189,696	269,109	41.8%	5.2	224.0
10	Haryana	143,111	166,336	16.2%	3.2	577.4

Source: Authors

Key observations from the table are-

Fastest growing among the top 10: Delhi (45.8%) and Bihar (41.8%)

Negative growth: Kerala (-36.0%), Tamil Nadu (-2.6%), Gujarat (-1.0%)

Highest crime rate: Delhi (1586.1) and Kerala (1287.7)

Top contributor to India's crime numbers: Uttar Pradesh (12.2%)

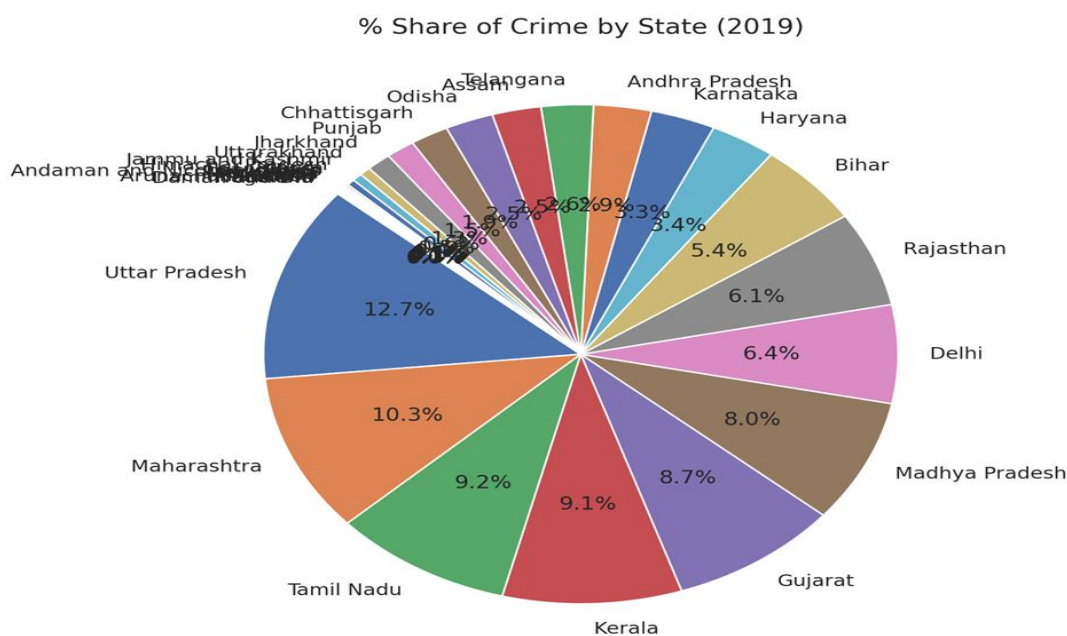
In 2019, among the ten states with the highest number of reported crimes, Delhi experienced the most notable rise in crime cases over the four years, recording a 45.8% increase, while Bihar followed closely with a 41.8% rise. In contrast, certain states witnessed a drop in crime figures during the same period—Kerala experienced the sharpest decline at -36.0%, and both Tamil Nadu and Gujarat reported modest decreases of -2.6% and -1.0%, respectively.

When looking at crime rates per one lakh population, Delhi recorded the highest at 1586.1, followed by Kerala at 1287.7, reflecting a greater frequency of reported crimes relative to their population size. In terms of contribution to the national crime tally in 2019, Uttar Pradesh stood out as the leading state, responsible for 12.2% of all reported crimes across India.

In the Telugu-speaking states, Andhra Pradesh and Telangana contributed 2.8% and 2.5% respectively to India’s total crime burden in 2019. Their crime volumes remained relatively stable, with Andhra Pradesh recording 1.45 lakh cases and Telangana 1.31 lakh cases in 2019. Telangana's crime rate stood at 352.0, significantly higher than Andhra Pradesh’s 278.6, suggesting possible differences in enforcement practices, public awareness, or socio-economic dynamics.

Figure 1 shows the state wise share of crime in the year 2019, shown in a pie chart. It is observed that Uttar Pradesh and Maharashtra are the leading states in holding about 20 per cent of total crime in India. It confirms the study of Maiti and Das (2023), and Maity and Das (2024).

Figure 1: State wise share of crime in 2019

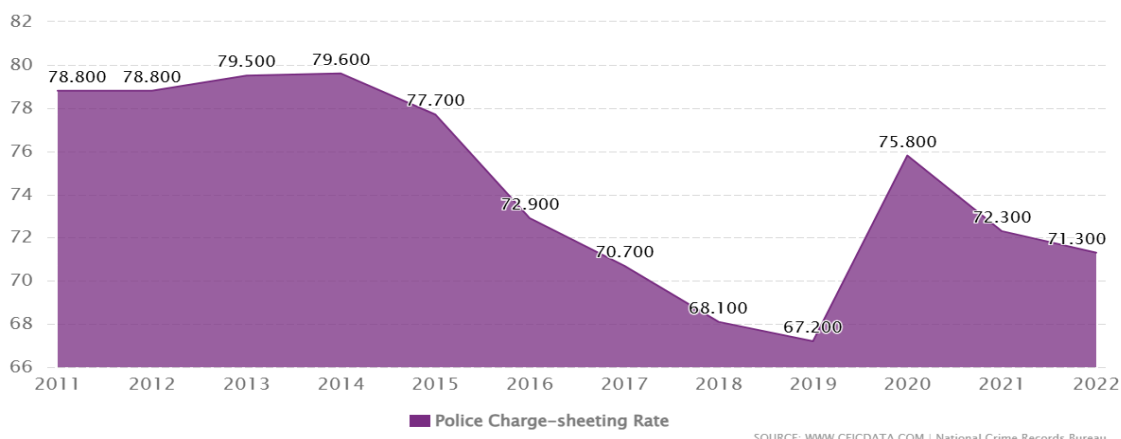


Source: Drawn by authors

Overall, the data highlights not only the regional variation in crime patterns but also the diverse capacities of state police systems. The persistent rise in crime underscores the necessity for adopting smart, technology-based policing solutions tailored to the unique demographic and infrastructural conditions of each state.

To control crime there are several measures taken by the police departments across the states and all India levels. Figure 2 presents the scenario of India's police charge-sheeting rate from 2000 to 2022.

Figure 2: India's police charge-sheeting rate from 2000 to 2022

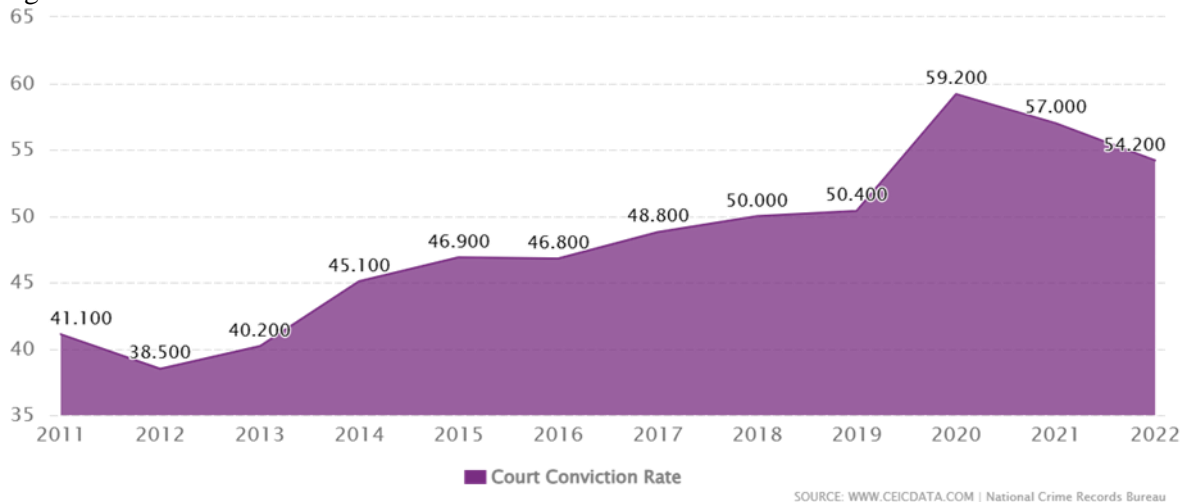


Source: Compiled by the authors

Police Charge-sheeting Rate data was reported at 71.300 % in 2022. This records a decrease from the previous number of 72.300 % for 2021. Police Charge-sheeting Rate data is updated yearly, averaging 78.800 % from Dec 2000 (Median) to 2022. India's crime numbers show a steady increase over the years. Andhra Pradesh saw a rise in 2017 but has remained relatively stable since then. Telangana experienced a slight rise and dip, but the overall trend is consistent without dramatic changes.

Figure 3 presents the court conviction rate in India from 2000 to 2022. It shows a steady rising trend in the conviction rate.

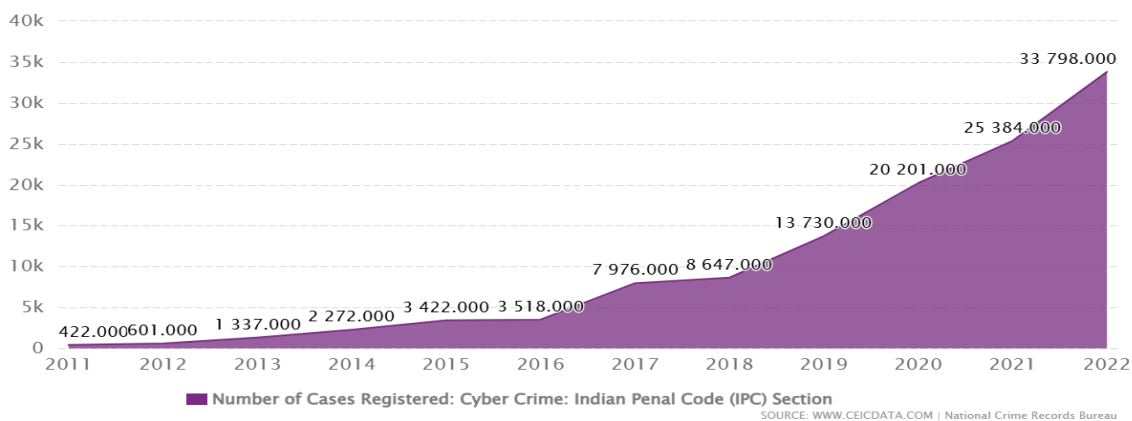
Figure 3: India's court conviction rate from 2000 to 2022



Source: Compiled by the authors

Figure 4 shows the number of cases of cybercrime registered from 2002 to 2022 in India which also shows rising trends over the years. It is an alarming situation so far as maintaining social stability is concerned.

Figure 4: India's Cyber Crime: IPC Section: Number of Cases Registered from 2002 to 2022

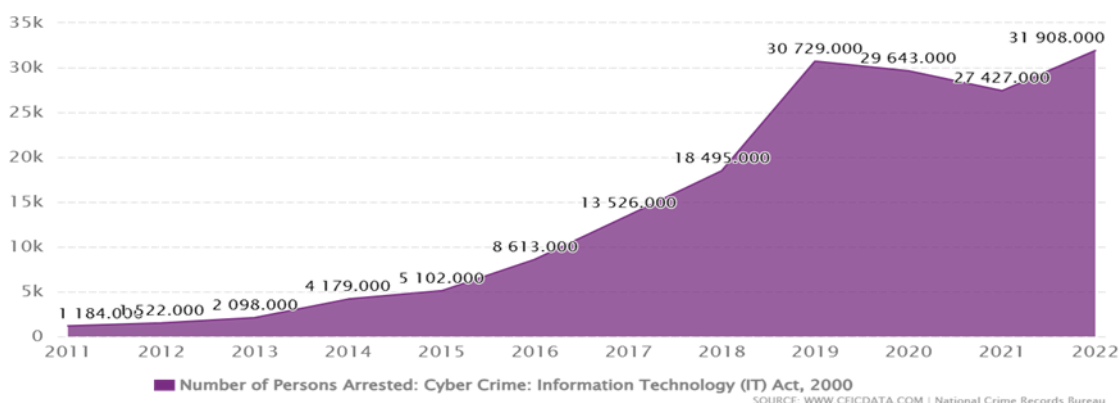


Source: Compiled by the authors

IPC Section: Number of Cases Registered data was reported at 33,798.000 Units in 2022. This records an increase from the previous number of 25,384.000 units for 2021. Cyber Crime: IPC Section: Number of Cases Registered data is updated yearly, averaging 738.000 units from Dec 2002 (Median) to 2022, with 21 observations. The data reached an all-time high of 33,798.000 units in 2022 and a record low of 176.000 units in 2008.

Figure 5 depicts the Number of Persons Arrested in India under cybercrime from 2002 to 2022 which also shows rising trends.

Figure 5: India's Cyber Crime: IT Act, 2000: Number of persons arrested from 2002 to 2022



Source: Compiled by the authors

The number of Persons Arrested data was reported at 31,908.000 persons in 2022. This records an increase from the previous number of 27,427.000 persons for 2021.

The correlation analysis

It is observed from the above figures that there might have some associations between all the three heads of crime data. Table 2 displays the correlation results.

Table 2: Correlation results

Correlation coefficients	Between Conviction & Registered cybercrime	Between Conviction & Arrested cybercriminals	Between Registered cybercrime & Arrested cybercriminals
	0.930811	0.89935426	0.918974

t values	8.446352	6.82223154	7.729535
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Source: Authors

It is observed that there are strong positive and significant correlations between all the three sets of data on crime which provokes the government of India to take necessary actions for combating the social unrest.

6. Policy Recommendations: Leveraging Technology to Reduce Crime and Foster a Harmonious Society

Achieving a society free from crime and grounded in harmony requires not only the swift detection and punishment of offenders but also the strategic use of modern tools to prevent crime proactively. Traditional policing methods, though foundational, are no longer sufficient to address the scale, complexity, and evolving nature of criminal activity in contemporary India. The integration of advanced technologies into policing systems offers a transformative solution, enhancing law enforcement efficiency while acting as a powerful deterrent to criminal behaviour.

Real-time surveillance technologies such as closed-circuit television (CCTV) networks, unmanned aerial vehicles (drones), and facial recognition systems significantly enhance the monitoring of public spaces. Their visible presence helps deter unlawful activity by increasing the perceived risk of detection. Complementary tools like automatic number plate recognition (ANPR) and artificial intelligence-driven predictive policing models enable authorities to identify crime-prone areas and allocate resources strategically, thereby preventing crimes before they occur.

Scientific investigative tools such as digital forensics, DNA profiling, and the Automated Fingerprint Identification System (AFIS) have elevated the accuracy of criminal investigations. These technologies ensure that perpetrators are identified and prosecuted based on robust evidence, leading to higher conviction rates and strengthening public faith in the justice system. Additionally, digital platforms like online FIR filing portals, mobile crime tracking applications, and the Crime and Criminal Tracking Network and Systems (CCTNS) help streamline the reporting process, reduce bureaucratic delays, and improve responsiveness.

Transparency and accountability in policing are reinforced through the use of body-worn cameras, GPS-enabled patrol vehicles, and automated grievance redressal systems. These tools not only enhance oversight of police behaviour but also improve citizen engagement and trust—crucial elements for building long-term social cohesion.

Moreover, technology empowers data-driven governance. It enables policymakers to assess crime patterns, identify underlying socio-economic contributors such as unemployment or substance abuse, and develop targeted, preventive interventions. This holistic approach helps move policing beyond enforcement toward community-oriented problem-solving.

In essence, the adoption of smart policing technologies is not merely about apprehending criminals—it is about reshaping the criminal justice ecosystem to deter crime, respond swiftly and fairly, and foster a culture of trust and safety. As India navigates a critical phase marked by rapid urbanization and digital growth, the transition to tech-enabled policing becomes an imperative rather than an option.

However, this transformation must be underpinned by robust legal safeguards and ethical frameworks. The deployment of surveillance and AI tools must respect fundamental rights, ensuring that efficiency does not compromise liberty. The future of policing in India lies in a balanced approach, where innovation is pursued with integrity, and justice is delivered with both precision and compassion.

7. Conclusion

Establishing a society that is both secure and peaceful requires more than relying solely on traditional policing methods. In today's dynamic environment, a shift towards a technology-enabled approach to law enforcement is essential. While time-tested practices still hold value, they need to be complemented by advanced tools that enhance crime prevention, detection, and response capabilities. The growing use of technologies such as surveillance cameras, artificial intelligence, digital forensics, and citizen-friendly platforms is gradually transforming the landscape of policing in India.

These modern systems contribute not only to faster and more accurate investigations but also strengthen transparency, accountability, and public confidence—cornerstones of a fair and trustworthy justice system. When implemented responsibly, smart policing can enable a shift from merely reacting to crimes to anticipating and preventing them through community engagement and data-driven strategies. With rapid urbanization and technological growth, adopting such innovations has become a necessity for effective policing in the country.

However, this technological transformation must be carefully aligned with ethical standards and legal protections. Tools like AI and surveillance must be used in ways that uphold individual rights and democratic values. The future of policing in India rests on striking the right balance—leveraging innovation to improve safety while maintaining a firm commitment to justice, human dignity, and the rule of law.

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