



Can AI Reform Justice? A Juridical Study on the Use of Artificial Intelligence to Overcome Procedural Impediments in Rape Trials

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Abstract: The paper critically reviews how Artificial Intelligence (AI) could be used to restructure the procedure of rape trials in India. Although this has been changed through various legislative amendments, such as Criminal Law (Amendment) Act, 2013, the rape adjudication process continues to be marred by institutional insensitivity, evidence gaps, and systemic delays that tend to retraumatize the victims. This paper challenges the reproduction of gendered and structural injustice by the very process of legal procedure using a triangulated theoretical approach that incorporates feminist jurisprudence, procedural justice theory, and victimology. Based on the doctrinal analysis, real-life cases of India (including Mathura, Unnao, Hathras), and comparative models in the United Kingdom, the United States, and South Africa, the research examines globally experimented survivor-sensitive procedural mechanisms. The paper subsequently reviews the extent to which AI can be used as a supplementary tool to increase the transparency and accountability of the procedure, including case triaging and delay monitoring, as well as the NLP analysis of courtroom discourse. Nevertheless, it warns against techno-solutionism by discussing such major risks as algorithmic bias, opaqueness, and survivor consent violations. The paper ends with the suggestion of a three-level reform agenda: procedural mandates, which can be enforced, ethically regulated AI integration, and the institutional design that is survivor-centered (in the vein of Thuthuzela Care Centres). Finally, this study claims that AI can be utilized as a tool to constitutional and trauma-informed justice, but not as an alternative to it. The results are part of the new discussions on ethics of legal-technology, gender-sensitive judicial adjudication, and the future of criminal justice in postcolonial democracies.

Keywords: Artificial Intelligence in Justice, Rape Trials in India, Procedural Justice, Feminist Jurisprudence, Legal Tech Ethics

1. Introduction

Rape is one of the most legally, socially, and institutionally disputed crimes in all jurisdictions, not only due to the nature of the crime but also because of the deep issues that the adjudication of the crime raises. Other legal changes that have been made in India have not been effective to eradicate the court delays and institutional apathy and physical retraumatization of victims in the process of the rape trials. Following the Nirbhaya gang rape tragedy, the Criminal Law (Amendment) Act, 2013 was widely acclaimed as a game changer in the Indian criminal law. It broadened the definition of rape in Section 375 of the Indian Penal Code (IPC), opened fast-track courts, and banned character assassination of the victims in court (Verma Committee Report, 2013; Indian Penal Code, 1860). However, over ten years later, the rape cases remain marred by institutional slowness, evidence failures, and secondary victimization, which undermine the access to justice by the survivors (Dash, 2020; Baxi, 2014).

The procedural design of rape adjudication investigation, evidence gathering, cross-examination and appellate review can be another injury to survivors (Herman, 1992). Courts often permit intrusive questioning, police investigations are held up or poorly managed, and fast-track courts are a reflection of the inefficiencies of ordinary courts (Kaur and Kaushik, 2024; Wieberneit et al., 2024). They do not just constitute administrative failures but are structural and systemic failures that are patriarchal, adversarial, and caste-coded in the legal system in India (Roy, 2025; Crenshaw, 1991). Researchers believe that procedural injustice makes courts hostile places instead of redressive (Smart, 2002; Katz, 2022).



In this regard, the integration of artificial intelligence (AI) into the judicial systems is both promising and dangerous. AI has been implemented in courts around the world to manage cases, conduct legal research, and predictive analytics, and even sentencing assistance (Guha et al., 2024; Kirschengast, 2016). The Supreme Court of India has already tested an AI-based tool, SUPACE (Supreme Court Portal for Assistance in Courts Efficiency), which helps the judges with the synthesis of legal documents. Nevertheless, despite the beneficial effect of AI on judicial efficiency, it also raises serious ethical and constitutional issues, such as bias, transparency, and accountability (Vinod Kumar, 2018; Richards, 1976). The question therefore is; Can AI restructure procedural justice in rape cases without worsening structural inequalities?

This paper is a critical examination of how AI can be used to transform procedural barriers in rape cases in the Indian criminal justice system. It is based on three theoretical frameworks related to each other: feminist jurisprudence, which criticizes the patriarchal nature of the legal process (MacKinnon, 1989; Roy, 2025); procedural justice theory, which focuses on the fairness, dignity, and voice in court (Tyler, 2006; Hohl et al., 2025); and victimology, which examines the psychological trauma and marginalization by institutions of the survivors (Herman, 1992; Kaur and Kaushik, 2022). The methodology of the research is doctrinal, theoretical, and comparative in nature, as it deals with the legal texts, case law, and global models in the UK, USA, and South Africa to evaluate the feasibility of AI-based reforms.

By doing this, this article addresses a gap that is very critical in Indian legal scholarship. Although a lot has been said regarding the substantive rape law and the symbolism of landmark cases, there has been little exploration on how technological tools can be used to improve procedural justice without undermining due process and increasing epistemic injustice. Over the last several decades of Indian legal reform, repeated efforts have been unable to address the long-running procedural issues in the rape trial procedures that generate delays along with retraumatization and institutional apathy. Criminal Law (Amendment) Act, 2013 was highly acclaimed as a groundbreaking move in the criminal legislation in India following the Nirbhaya gang rape incident.

In line with this, the aims of the study are four:

- (1) to establish and classify the procedural obstacles in Indian rape cases;
- (2) to critically evaluate how AI can be used to overcome these barriers;
- (3) to explore the legal and ethical consequences of AI-based procedural changes; and
- (4) to make a series of jurisprudentially and socially feasible suggestions that are in line with the constitutional vision of justice in India.

2. Understanding Procedural Impediments in Indian Rape Trials (Modified)

Given ineffective procedures, institutional animosity, and structural exclusivity, the procedural aspect of rape adjudication in India continues to face difficulties. Using constitutional guarantees found in Articles 14, 21, and 39A of the Indian Constitution, this section examines the procedural obstacles that arise during rape case investigations, trials, and appeals.

2.1 Legal Framework Governing Rape Procedure in India

India's rape adjudication procedural framework is mainly controlled by:

- Code of Criminal Procedure (CrPC), 1973 – controls the conduct of investigations, arrests, trials, and appeals.
- Indian Evidence Act, 1872 – determines cross-examination and admissibility.
- Indian Penal Code (IPC), 1860, especially Section 376 – provides the legal definition and punishment for rape.
- Criminal Law (Amendment) Act, 2013 – enacted post-Nirbhaya to expand definitions and establish fast-track mechanisms.

While these provisions theoretically construct a survivor-oriented legal framework, implementation is restricted by gendered bias, procedural incoherence, and institutional inertia (Dash, 2020; Sharma, 2024).

2.2 Typology of Procedural Impediments

Table 1: Typology of Procedural Barriers in Indian Rape Trials

Stage	Procedural Barrier	Relevant Law	Source
Investigation	Delayed FIR registration	CrPC §154	NCRB (2022); Singhmar et al. (2024)
	Inconsistent forensic protocol application	CrPC §164A, §173	MHA SOP (2022); Pathak & Sharma (2024)
	Absence of trauma-informed policing	No statutory standard	Kaur & Kaushik (2024); Ramesh (n.d.)
Trial	Character-based cross-examination	Evidence Act §146	Gurmit Singh (1996); Roy (2025)
	Adjournments and backlog	CrPC §309	Dash (2020); Baxi (2014)
	Hostile courtroom atmosphere	Judicial advisories only	Herman (1992); Smart (2002)
	Technology underutilization (video/audio testimony)	CrPC §273, §275	UNODC (2014); Gautam (2022)
Appellate	Delayed case disposal	CrPC §§374–377	Wieberneit et al. (2024); Vinod Kumar (2018)
	Victim exclusion from appellate review	No mandated role	Roy (2025); Naik & Kumari (2023)

2.3 Investigative Stage Failures

Administrative lapses usually nullify the probing value of the investigation phase. Delayed FIR registration is still common even after CrPC §154, and it is usually because of institutional inertia or fear of victimization. It has been acknowledged by the courts that delay is not a sufficient reason to discredit testimony. Prem Singh, AIR 2009 SC 1010), but these delays are often used to acquit at the trial level.

The failure to apply forensic procedures consistently as per CrPC 164A is a systemic failure. The rural population is particularly underserved, and there is little access to forensic services, and a lack of trained staff (MHA, 2022). The Justice Verma Committee recommended standardized forensic timelines and trauma-informed protocols—recommendations yet to be uniformly implemented.

2.4 Trial Stage: From Adjudication to Secondary Victimization

The Indian courtroom tends to recreate trauma, as it is not a place of justice, but a place of unbelief. In *State of Punjab v. The Supreme Court* denounced character-based questioning as a redundant and offending practice (Gurmit Singh, 1996). Nevertheless, the Indian Evidence Act, which is designed to restrict such practices, Section 146, is often circumvented or not enforced (Roy, 2025; Baxi, 2014). The Mathura case (*Tukaram v. State of Maharashtra*, AIR 1979 SC 185) is a seminal case of judicial adherence to the proxy of consent, resistance, epistemic failure, which is reflected in lower court attitudes to this day.

Instead of offering a solution, fast-track courts, which were conceived as a solution after the Nirbhaya incident, have recreated systemic issues. They frequently do not have any actual procedural acceleration or survivor sensitivity, as they are understaffed, undertrained, and under-resourced (Bedi, 2023). The CrPC 309 schedule of judicial proceedings is still flexible, which has led to the prolonged time and repeated adjournment—both can be seen in the metropolitan and district courts (Dash, 2020).

2.5 Appellate Phase: Victim Disempowerment and Judicial Delay

The appeal procedure is also tumultuous. The appeals in rape cases, though provided by statute in CrPC, 374–377, are not prioritized in terms of time. Victims are frequently not informed of hearings or outcomes, despite their right to participate in justice under international standards (UNODC, 2014). This leads to the institutionalization of the erasure of the voice of survivors after conviction as Roy (2025) observes.

In addition, sentencing uniformity is a long-standing problem. Even similar factual matrices can have very different sentences imposed by one bench, which only increases the sense of arbitrariness and bias (Wieberneit et al., 2024). This is alleviated by comparative jurisdictions including the UK through organized sentencing systems and appellate review procedures, which India does not have at present (Brown, 2020).

2.6 Intersectional and Structural Failures

Survivors from marginalized communities—particularly Dalit and Adivasi women—face compounded procedural violence. This is demonstrated in the Hathras case: forensic delay, forced cremation, and misrepresentation of the facts in the media were a total institutional failure (Singhmar et al., 2024). The SC/ST (Prevention of Atrocities) Act is present, but the procedural assurances are hardly ever enforced by the courts and police (Naik and Kumari, 2023; Crenshaw, 1991).

2.7 Rethinking Procedure: From Reform to Structural Redesign

The systemic malfunction of the above-described procedural failures indicates a more systemic malaise: sexual violence is still viewed as an exception by courts and law enforcement and not an institutional norm that needs structural redesign. Survivors have to act like ideal victims, give emotionally coherent testimonies, and work in a hostile judicial culture (Herman, 2015; Smart, 2002). The tension between formal legal rights and procedural reality represents not only a gap in access but a crisis in justice delivery.

Although most researchers advocate the statutory tightening, including the mandatory time limits of FIRs and forensic filing according to CrPC §173, procedural inertia is not moved (Vinod Kumar, 2018; UNODC, 2014). Since delay, bias, and underperformance are deeply rooted, only legislative interventions cannot be used.

This leads to an interesting question: Could technological innovations, in particular, based on artificial intelligence, provide the solution to procedural delay, survivor agency, and trauma-sensitive adjudication? Rather than replacing judicial discretion, can AI augment decision-making, streamline case flows, and enforce compliance with statutory mandates?

3. Theoretical Framework: Rethinking Procedure through Feminist, Procedural, and Victimological Lenses

In order to question the multifaceted procedural failures of rape trials and evaluate the transformative power of artificial intelligence (AI), this work uses a triangulated theoretical approach to feminist jurisprudence, procedural justice theory, and victimology. The analysis of law process through these overlapping lenses can be done on a multi-dimensional level, not only with regard to results, but as an institutional, symbolic, and psychological process that can either empower or retraumatize survivors.

3.1 Framework Overview: Philosophical Basis and Relevance

Table 2: Comparative Overview of Theoretical Lenses Used

Framework	Core Focus	Key Scholars	Assumptions about Law	Relevance to Rape Trials	Implications for Reform
Feminist Jurisprudence	Law as structurally patriarchal	MacKinnon (1989), Smart (2002), Roy (2025)	Law encodes male dominance; legal neutrality is a myth	Law privileges male rationality; courtroom performance suppresses survivor voice; moral character scrutiny prevails	Requires epistemic reform: change in evidentiary norms, survivor-centered trial design, and critique of courtroom rituals
Procedural Justice Theory	Fairness, dignity, and legitimacy in legal process	Tyler (2006), Hohl et al. (2025), Vinod Kumar (2018)	Legitimacy arises from perception of fairness, not just outcomes	Survivors disengage due to perceived disrespect, lack of voice, and procedural opacity	Mandates respectful treatment, victim participation, trauma-informed personnel, and transparent case timelines
Victimology	Psychological harm from legal process	Herman (1992), Kaur & Kaushik (2024), Murphy-Oikonen (2022)	Adversarial systems may re-traumatize; institutions often neglect trauma	Survivors suffer secondary victimization due to repetitive questioning, insensitive procedures, and system silence	Reform must include trauma-informed testimony practices, legal counseling, and procedural support structures

Framework	Core Focus	Key Scholars	Assumptions about Law	Relevance to Rape Trials	Implications for Reform
Intersectionality	Law's differential impact across identities	Crenshaw (1991), Beleli (2016), Singhmar et al. (2024)	Legal systems erase caste, class, and geography from formal equality	Marginalized survivors (Dalit, tribal, rural) face compounded procedural exclusion and silencing	Demands caste-aware legal process, localized forensic systems, and differentiated procedural protections

3.2 Feminist Jurisprudence: Gendered Logic of Legal Procedure

Through feminist legal theory the law gets exposed as a structural masculine force which embeds gender biases in both legal content and judicial procedures. Catharine MacKinnon (1989) maintains that rape law controls female sexual behavior rather than safeguarding it through male-dominated definitions of consent.

This is evident in *Tukaram v. State of Maharashtra* (1979), The Supreme Court of India acquitted police officers in the Mathura case by stating that the victim did not resist their sexual assault despite the fact that power dynamics and institutional control were absent from their decision. Smart (2002) explains that this type of legal thinking forces women to follow specific standards of trauma expression during court proceedings.

Feminist scholar Roy (2025) argues that despite reforms following 2013 India has not succeeded in dismantling this epistemic violence. Survivors continue to face character-based interrogation even though Section 146 of the Indian Evidence Act provides them with statutory protection. Survivors face symbolic disempowerment in courtrooms because they need to prove their credibility through adherence to cultural victimhood standards.

3.3 Procedural Justice Theory: Voice, Trust, and Legal Legitimacy

The analysis of symbolic law violence from feminist jurisprudence receives an explanation about fairness experiences from procedural justice theory. According to Tom Tyler (2006) people will accept unfavorable outcomes if they experience legal processes as respectful and inclusive.

The theory finds support in Indian rape trials because survivors often stop participating because of secondary trauma combined with delayed proceedings and feelings of disrespect. The Unnao rape survivor endured multiple threats and court delays before attempting suicide because she received no support from police or judicial authorities during the case (2017). The suspicious car accident that killed her on her way to court demonstrates both institutional betrayal and procedural alienation.

In their evaluation of Tyler's theory for sexual violence cases Hohl Jackson and Bradford (2025) demonstrate that procedural dignity represented through hearing opportunities and respectful conduct and transparent communication plays a vital role in how survivors perceive justice. The dimension of procedural dignity remains absent in Indian society. The procedures within fast-track courts typically match those of ordinary courts yet victims typically do not actively engage with their own court process.

3.4 Victimology: Legal Process as Psychological Harm

Victimology offers a third necessary prism, through the lens of which the legal processes themselves can be discussed as the sources of trauma. Judith Herman (1992) believes that the legal systems tend to recreate the psychological damage through requiring the survivors to retell trauma in linear, emotionally detached, and rationally in line with the expectations that are neurologically incapable of responding to the trauma.

The Nirbhaya case (2012) was a legal success (in terms of conviction and sentencing) but showed the shortcomings of a punitive, procedural process. Despite public mobilization, the trial was marked by spectacularized justice and procedural speed, not introspection. The death penalty was celebrated in the state, and the institutional lessons of trauma-informed testimony, police reform, and dignity of the survivors were not addressed (Irfan, 2021; Bourke, 2022).

In lesser-known cases, such as Hathras (2020), systemic disregard for trauma was compounded by caste and class bias. The 19 year old Dalit girl victim was refused medical attention, was administratively hindered and her corpse was even cremated by the police contrary to the wishes of her family. Procedurally, the victimological perspective of the process was more violent than the offense itself.

3.5 Toward a Jurisprudence of Integrated Reform

This is a triangulated theoretical model that makes it possible to critique procedural injustice in a layered way. It describes the reasons behind disengagement of survivors, failure of institutions and why reform should not be limited to doctrine. Legal procedure is not a neutral instrument but a coded social process that should be evaluated by the way it identifies power, esteems emotion and reinstates dignity.

Table 3: Applying Theory to Real-Life Cases

Case Name	Year / Jurisdiction	Applicable Theories	Core Procedural Failures Identified	Key Insight for Reform
Mathura (Tukaram v. State)	1979 / India	Feminist Jurisprudence	Presumed consent due to lack of physical resistance; moral scrutiny of victim; institutional denial of coercion	Law's definition of consent must reflect power dynamics; survivor subjectivity must be centered
Unnao Rape Case	2017–2020 / India	Procedural Justice + Victimology	Police delay, institutional shielding of politician, intimidation of survivor, lack of witness protection	Perceived injustice fosters distrust; urgent need for protective mechanisms and survivor participation
Nirbhaya (Delhi Gang Rape)	2012 / India	Victimology + Feminist Jurisprudence	Legal spectacle overshadowed survivor dignity; trauma erased from public discourse; process overpowered by punishment narrative	Fast-track courts need trauma-informed standards, not just speed or severity
Hathras Rape and Murder	2020 / India	Intersectionality + Victimology	Caste-based denial of access to justice, premature cremation, medical delay, public narrative control by police	Caste-aware protocols, decentralized forensic care, and mandatory victim-family inclusion
Mukesh & Anr v. State (Nirbhaya)	2017 / India	Feminist Jurisprudence + Spectacle Justice	Death penalty used as proxy for justice; systemic issues unaddressed (court culture, police bias, gendered courtroom logic)	Symbolic punishment must not substitute for procedural integrity and survivor agency
MC v. Bulgaria (ECHR)	2003 / Europe	Feminist Jurisprudence + Procedural Justice	State failure to investigate lack of consent despite no physical resistance; ruling redefined consent in European jurisprudence	Precedent for affirmative consent models and minimal resistance standards
Thuthuzela Model (South Africa)	Ongoing / South Africa	Victimology + Procedural Justice + AI-ready	Integrated response model avoids institutional silos; provides medical, legal, and psychological services under one roof	AI systems must align with integrated care models and ensure survivor control over narrative and access

Collectively, these cases demonstrate how procedural injustice is systemic rather than accidental and why any proposed legislative or technological reforms must meet three interrelated requirements:

- Gendered awareness (feminist jurisprudence)
- Procedural respect and inclusion (procedural justice)
- Trauma-informed sensitivity (victimology)

These frameworks will serve as moral standards throughout this study of how AI promotes procedural changes. In order to help dismantle discriminatory structures using survivor-based jurisprudence as a guide, AI systems must avoid bias duplication of existing systems.

4. Comparative Jurisdictions: Models of Procedural Reform in Rape Trials

The reform initiatives for rape trial procedures differ substantially between different jurisdictions. Some nations have created progressive specialized trial procedures that simultaneously decrease courtroom delays while ensuring

victim protection and increasing successful legal outcomes. The analysis evaluates three jurisdictions namely UK, US, and South Africa through the framework of feminist jurisprudence together with procedural justice theory and victimological concepts. The examination evaluates how each system balances smooth operations with survivor assistance while maintaining lawful procedures to determine their potential applicability in India.

4.1 United Kingdom: Special Measures and Legal Intermediaries

The United Kingdom established a survivor-protective system through special measures that protect survivors during sexual offences trials. The Youth Justice and Criminal Evidence Act 1999 Section 28 allows pre-recorded testimony while in-camera hearings and registered intermediaries help survivors communicate with the courtroom.

The courtroom procedures now operate between adversarial and inquisitorial models which helps survivors avoid additional trauma while decreasing the mental strain of facing direct cross-examination. Their alignment with procedural justice theory is evident: survivors are provided with voice, dignity, and perceived fairness (Hohl et al., 2025). Other researchers, however, like Munro (2020) have criticized the loss of juror empathy when the testimony is displayed digitally, which may undermine the effect of evidence.

In India, although the video testimony provisions in Section 275 of the CrPC are present, they are not fully applied because of the infrastructural constraints and the lack of judicial knowledge of trauma-informed practices (Naik and Kumari, 2023).

4.2 United States: Trauma-Informed Courts and Technological Integration

The US has unveiled a strong model that integrates trauma-informed courtroom practice and technology. A majority of jurisdictions have rape shield laws (Federal Rule of Evidence 412), which prohibit the investigation of the sexual history of a survivor. Most of the state courts have victim advocates, required judge training on trauma, and electronic systems like eDiscovery platforms that help in exchange of evidence.

This model is very close to the feminist jurisprudence and victimology, as the survivor is a rights-bearing person whose trauma needs to be accommodated on an institutional level. The use of AI in case management and risk prediction, including the use of such tools as COMPAS, has made the process more efficient, yet also brought up the issue of racial and socio-economic discrimination, especially in sentencing (Angwin et al., 2016).

India can follow the U.S. example by requiring trauma-informed training in the framework of judicial academies, enhancing digital evidence infrastructure, and ensuring any AI application is regulated in a transparent and anti-bias manner.

4.3 South Africa: Integrated Legal and Medical Response through TCCs

The innovation in South Africa is its Thuthuzela Care Centres (TCCs) or multidisciplinary one-stop centres that were set up to assist the survivors since the time of assault to the legal decision. TCCs are located in hospitals and provide instant forensic services, psychological services, reporting to the police, and prosecutorial contact- all under one roof.

These centers represent victimology in its structural sense, avoiding secondary victimization since they do not allow repetitive storytelling and allow preserving evidence very quickly. According to Artz and Smythe (2007), TCCs minimize the attrition of the survivor because they integrate the otherwise disjointed efforts by police, hospitals, and courts. However, even in South Africa, there are still criticisms of unequal distribution of resources between urban and rural TCCs, and at times procedural flaws.

The One Stop Centres that were launched in India as part of the Nirbhaya Fund tried to follow this model. Nevertheless, as a 2021 audit by the National Commission of Protection of Child Rights showed, most centers did not have access to forensic access, trained legal officers, or psychological counseling. The TCC model is very flexible to India but needs enhanced inter-agencies coordination, legal integration, and long-term funding.

4.4 Comparative Synthesis

In order to summarize the discussion, the table below provides a comparative perspective on each jurisdiction on its core procedural model, theoretical emphasis, main innovations, and challenges:

Table 4: Comparative Overview of Procedural Reform Models

Jurisdiction	Procedural Model	Theoretical Alignment	Core Innovations	Key Challenges / Critiques
United Kingdom	Special Measures in Sexual Offences Trials	Procedural Justice Theory	Pre-recorded testimony, legal intermediaries, in-camera hearings	Reduced emotional engagement by jurors (Munro, 2020)
United States	Trauma-Informed, Tech-Enabled Courts	Feminist Jurisprudence, Victimology	Rape shield laws, judicial trauma training, digital platforms, AI case tracking	Algorithmic bias in AI tools (Angwin et al., 2016); state-wise implementation gaps
South Africa	Thuthuzela Care Centres (Integrated Triage)	Victimology, Procedural Justice	Unified legal-medical-psych support, immediate forensic access, one-time testimony	Unequal resource distribution; lack of rural expansion (UNODC, 2014)

4.5 Adapting Comparative Models to India

All the reviewed jurisdictions provide useful information, but India needs to do local adaptation and not institutional imitation. The model used in the UK requires technology investments and recalibration of procedures, particularly in the lower courts. The U.S. model emphasises the necessity of AI regulation and trauma jurisprudence, whereas the South African model is structurally most transferrable, assuming that India has to restructure its One Stop Centres to enable actual convergence between agencies and are integrated into the legal framework of the district judiciary.

Moreover, any technological change based on these models, especially the scheduling, document processing, or case triaging with the involvement of AI, should be introduced in a manner that is transparent, ethically controlled, and trauma-sensitive. This is in line with the principles that are underpinning the theoretical framework of the present study: dignity, fairness, and procedural recognition of trauma.

5. The Role of Artificial Intelligence in Procedural Reform of Rape Trials

The adoption of Artificial Intelligence (AI) in the judicial system is growing at a very fast rate, but its implementation to address the particular problems of the procedure in rape cases has not been theoretically developed and tested in the law of most Global South countries. This part examines normative, institutional and technical aspects of AI as a potential facilitator of procedural justice in Indian rape cases. It builds on the previous theoretical backgrounds such as feminist jurisprudence, procedural justice theory, and victimology to make sure that any AI reform suggested is not only efficient but also just, inclusive, and survivor-sensitive.

5.1 Conceptualizing AI as a Juridical Instrument

The field of AI in law is broad and includes such tools as natural language processing (NLP), machine learning classifiers, and automated decision support systems. They are already deployed in nascent form in Indian courts, with the SUPACE (2021) system of the Supreme Court automating the legal research and document summarization.

AI has certain potential in rape trials to overcome procedural inefficiencies:

- Automating case triage and delay detection;
- Tracking evidence integrity and chain-of-custody;
- Enhancing inter-institutional data sharing and procedural compliance;
- Analyzing courtroom discourse for gender bias;
- Predicting delay risks in docket scheduling.

However, these capabilities must be approached juridically, not merely technologically. As Richards (1976) points out, any procedural change must meet legal neutrality, transparency, and contestability.

5.2 AI Applications across the Rape Trial Process

A systematic mapping of AI's use across trial stages is shown in Table 5. This table also predicts risks and outlines needed legal protections.

Table 5: Potential AI Interventions Across Procedural Stages in Rape Trials

Stage	AI Functionality	Potential Benefits	Key Risks	Required Safeguards
Investigation	FIR delay prediction; data entry standardization	Early detection of procedural non-compliance	Data entry bias; privacy violations	Role-based encryption; consent-based data protocols
Forensic Handling	Chain-of-custody verification via blockchain; case mapping	Prevents evidence contamination; traceable custody	Overreliance on tech; systemic errors	Hybrid model with manual validation and audit log reviews
Courtroom Stage	NLP-based analysis of cross-examination scripts	Detects gendered patterns; checks trauma triggers	Cultural misreadings; context-blind patterning	Context-aware datasets; ongoing linguistic audit
Trial Scheduling	AI-driven docket management	Reduces backlog; improves time-boundedness	Resource inequity across jurisdictions	Statutory oversight on prioritization criteria
Appellate Review	Pattern mining in sentencing; consistency analysis	Reduces arbitrariness in sentencing	Judicial discretion erosion	Use as supplementary tool; not binding on appellate judges

These interventions must combine with institutional checks and trained human oversight to prevent technocratic overreach.

AI Integration in Criminal Justice Stages

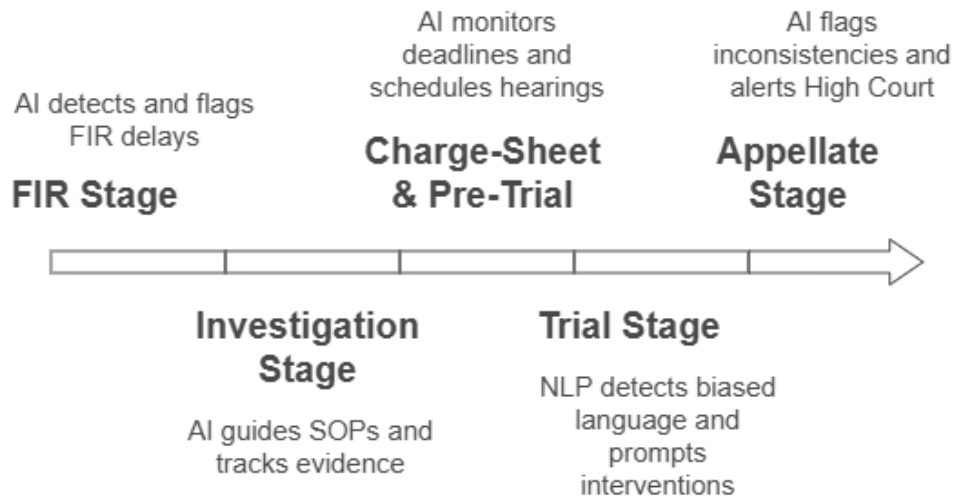


Figure 1: AI Integration across Criminal Justice Stages in Rape Trials

Figure 1 visualizes the way artificial intelligence can support the main steps of the procedure, including FIR registration and appellate review, and promote timeliness, accountability, and trauma-informed practice in the rape adjudication process in India.

5.3 Legal and Ethical Risks of AI in Rape Trial Settings

Even in cases where it might be beneficial, AI presents a number of jurisprudential and ethical issues, in particular, in the case of vulnerable survivors and crimes that are stigmatized:

Weaknesses in Opacity and Explainability: Most AI systems are black boxes that do not give users an opportunity to comprehend the way decisions are made. This compromises the provisions of natural justice, especially the right to appeal the foundation of a procedural ruling (Richards, 1976).

Bias and Discrimination in Algorithms: AI systems can reproduce biases in the existing judgments, provided that they are trained on datasets that are biased in terms of gender, caste, or class. The U.S. COMPAS system was discovered to have an overrepresentation of Black defendants being mislabeled as high-risk (Angwin et al., 2016), which is not a good sign of any unregulated importation of a similar system into the Indian highly stratified legal system.

Consent and Data Ethics: Rape trials are very sensitive medical and testimonial data. The autonomy of the survivor and informational privacy would be breached (Kumar and Baxi, 2024) because such data cannot be trained on the model without express and rescindable permission.

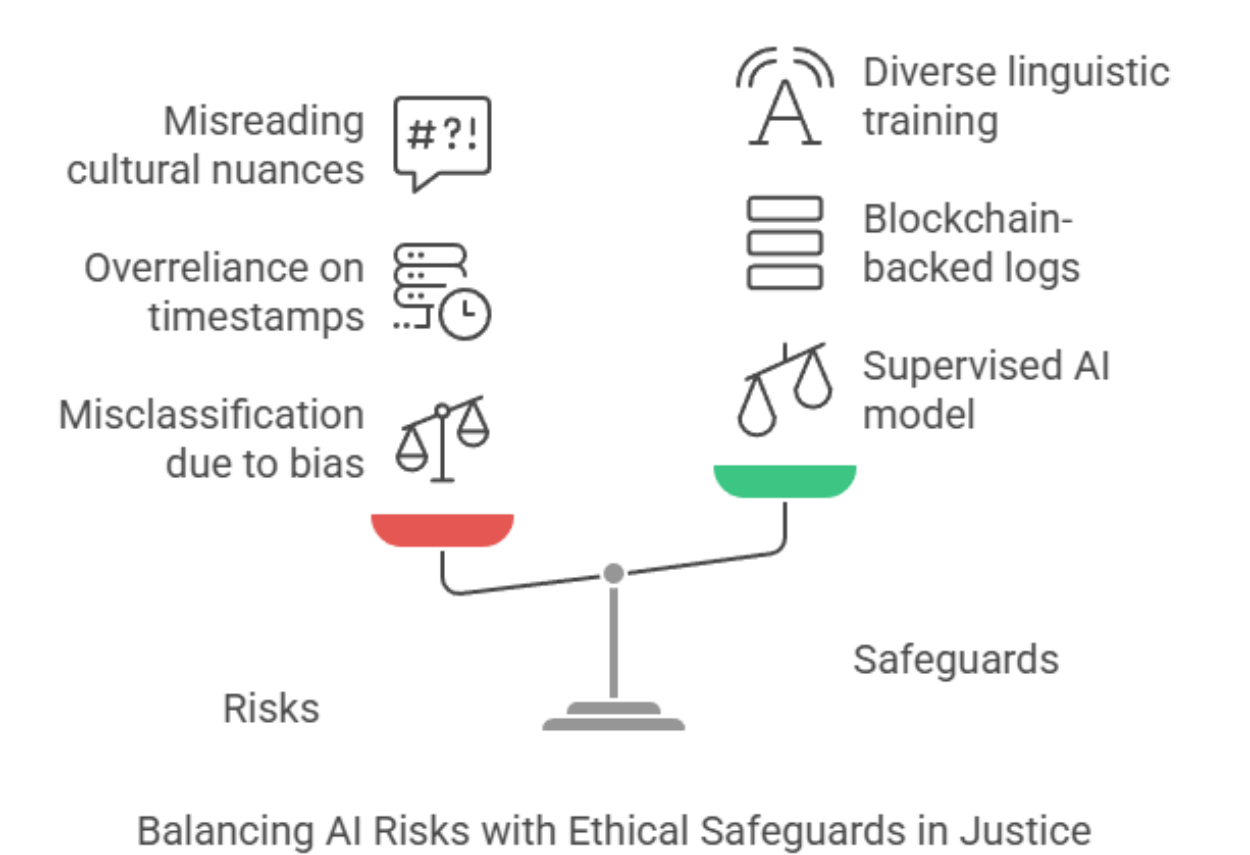


Figure 2: Balancing AI Risks with Ethical Safeguards in Criminal Justice

As shown in Figure 2, the risks from AI in sensitive legal situations, like bias and misinterpretation, must be balanced by ethical safeguards. These include supervised models and logs that can be verified using blockchain.

5.4 Theoretical Evaluation of AI’s Role

The use of AI in rape trials must meet a three-part legal test based on the frameworks discussed earlier in this paper:

Theoretical Lens	Criterion for AI Alignment
Feminist Jurisprudence	AI must actively disrupt, not encode, patriarchal norms; avoid use in moral profiling

Theoretical Lens	Criterion for AI Alignment
Procedural Justice Theory	AI should enhance transparency, consistency, and survivor voice—not diminish due process
Victimology	Must protect survivor well-being, prevent retraumatization, and preserve consent rights

When we measure AI against these standards, it is not naturally freeing or controlling. Its potential for justice depends on the design of governance, data ethics, and the purpose of institutions.

5.5 Designing an AI-Responsive Procedural Ecosystem in India

In order to make AI a force of justice when it comes to rape cases, the following system-level changes can be offered:

AI Governance Code of Indian Judiciary: This code should be drafted under the Digital India Act and it should require all judicial AI deployments to be transparent, auditable by algorithms and have role-based access.

Survivor-Centric Data Regulation: Legal provisions must require opt-in, revocable consent for using survivor case data in model training and testing.

Bias Detection Protocols: The AI systems applied in judicial analysis should be tested on intersectional bias, with the particular focus on caste, gender, and language indicators.

Judicial Officer Training Modules: All the judges and the court staff members should be trained to understand the interpretation, questioning, and contextualization of AI-generated outputs- the human oversight should always be at the center.



Figure 3: Procedural Flowchart of Rape Trials in India—Before vs. After AI Integration.

As Figure 3 demonstrates, AI can interfere at any point of the rape trial process, starting with FIR registration, through appellate review, which is compatible with institutional efficiency and trauma-sensitive design.

AI presents an opportune way to overcome the procedural bottlenecks of rape adjudication procedures that have long existed, especially in the areas of delay, evidence integrity, and case prioritization. However, automation is not the aim but modernization that is sensitive to justice. When implemented in constitutional protections and trauma-informed care, AI can be used to establish a faster, more just, and more dignified trial. Nevertheless, it should be rolled out with caution, and critically controlled, and survivor-led, otherwise it will be another level of institutional violence, as opposed to procedural reform.

6. Recommendations: Toward Survivor-Centric and AI-Integrated Procedural Reform

India needs a remedy to its institutional failure in the rape cases by coming up with integrated laws alongside technological innovations and institutional organizational changes. The recommendations in this section derive from doctrinal critiques and theoretical frameworks and comparative case studies and AI analysis that appear throughout this study. The proposed reforms consist of three main categories that include procedural reforms together with technological reforms and institutional reforms.

6.1 Procedural Reforms

The legal system shows progress yet procedural challenges such as delayed court proceedings and unprofessional trial practices and weak victim involvement remain active barriers. The entire rape trial process in India requires the establishment of firm time constraints at each procedural step. The fast-track court system shares similar delays with regular courts because judicial authorities lack the necessary power to expedite proceedings. The CrPC Section 309 requires amendment to limit judicial authority over adjournment decisions while performance audits of case timelines will enhance judicial responsibility.

The courts need to implement pre-recorded testimony procedures and in-camera testimony for vulnerable survivors based on Section 275 of the CrPC which currently receives limited application. Standard operating procedures should replace exceptional measures in these procedures. Survivor rights to privacy protection and timely case information and legal assistance should be established through formal legal provisions in the CrPC instead of depending on policy decisions. Procedural law in India includes survivor rights based on international standards defined by the UNODC's victim-centered justice guidelines.

6.2 Technological and AI-Enabled Reforms

Artificial intelligence technology supports faster processes but its application needs to respect human expertise together with trauma care regulations and legal standards. The combination of district courts and special courts should use AI dashboards to identify delays in First Information Report submissions and evidence submissions and court trial scheduling. All stakeholders must have access to the tools for building trust while ensuring compliance.

NLP systems need to be used for detecting bias during the analysis of judicial language and cross-examination scripts. The validated analytical models function as supporting tools for judges to review their work after receiving approval from neutral bias review groups and cultural standard adaptation.

Every implementation of Artificial Intelligence technology needs to operate under a consent-based system for data management. Survivor data requires explicit consent for AI training predictive analytics or automation but this consent remains revocable and has a defined time duration. The established data protocols must maintain consistency with India's Digital India Act data protection framework and international standards for information privacy.

6.3 Institutional Reforms

India needs to invest in coordinated institutional reform that goes beyond statutory and technological solutions. The Nirbhaya Fund established One Stop Centres (OSCs) possess substantial potential to transform into comprehensive justice facilities. The Thuthuzela Care Centres of South Africa serve as inspiration for OSCs to provide medical, legal and psychological services from a single facility. District legal service authorities together with prosecutors need formal integration into these centers to maintain procedural continuity and deliver services with sensitivity to trauma.

All judges along with prosecutors and investigating officers need to complete required training about trauma psychology and procedural sensitivity and AI ethics. The training programs must become mandatory components of judicial academy and police training institution curricula and service renewal or promotion should depend on successful completion of these programs. The implemented reforms will transform institutional cultures from rigid adversarial systems into sensitive relationship-based practices.

The Ministry of Law and Justice together with MeitY and NITI Aayog must create a Judicial AI Governance Framework. The regulatory document must specify ethical as well as functional and legal boundaries for AI tools in courtrooms and establish minimum requirements for transparency and auditability and survivor opt-out capabilities.

Table 6: A Three-Tiered Reform Strategy for Indian Rape Trials

Procedural Reform	Technological Reform	Institutional Reform
Time-bound trial mandates (CrPC amendments)	AI dashboards for delay detection	Integrated One Stop Centres (TCC-inspired)
In-camera / pre-recorded survivor testimony (mandatory use)	NLP tools for courtroom bias monitoring	Mandatory trauma and AI ethics training
Codified survivor rights (privacy, updates, representation)	Consent-driven survivor data infrastructure	National Judicial AI Governance Framework

Symbolic legal changes and digitization systems alone will not transform how rape cases are tried in India. Systemic change needs to protect survivor dignity through a balanced procedural system with proper institutional accountability. AI tools need to support the established goals by working in a legal structure which upholds constitutional values and applies feminist jurisprudence together with procedural justice principles and trauma-sensitive practice guidelines. A three-tiered reform strategy allows India to create a rape trial system that is both efficient and fundamentally just.

7. Conclusion

India continues to experience serious procedural issues in rape trials throughout the country even after major legislative changes have been established. The research shows that institutional problems exist in the legal system because they rely on adversarial practices and resistance within institutions. Victims of sexual violence often face more harm through the judicial processes that are supposed to deliver justice based on feminist jurisprudence, procedural justice theory, and victimology. Comparative models from the UK, USA, and South Africa highlight the effectiveness of trauma-informed, survivor-focused legal designs while warning against adopting technology without critical examination. In this context, artificial intelligence appears as a potential, though limited, tool for reforming procedures. Its application in case tracking, evidence management, and language auditing needs to follow ethical standards, human oversight, and survivor consent. Any AI use must enhance, not replace, constitutional guarantees of fairness and dignity. Therefore, this article suggests a three-part reform strategy: enforceable procedural rules, ethically managed AI systems, and integrated institutional support like restructured One Stop Centres. True justice in rape trials cannot come from digital innovation or increased punishment alone; it requires a restructured legal process that focuses on survivor agency, ensures respectful and timely decisions, and upholds India's commitment to equality and due process. The future of handling rape cases depends not on quick technological fixes but on fostering empathy, maintaining legal integrity, and promoting survivor-led reform.

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