



AI-Powered Digital Justice System: A Proposed Smart Platform for Complaint Filing and Tracking – A Review

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Abstract: Reporting crimes to police remains a tedious and inefficient experience across many jurisdictions. Citizens must physically visit police stations, complete handwritten forms, and submit complaints without receiving updates about case progress. This research proposes developing an AI-Enhanced Smart Platform for Complaint Management to address these challenges. The proposed system enables citizens to file complaints through three methods: written text, audio recordings, or video submissions. After receiving a complaint, the platform employs Natural Language Processing (NLP) to analyze content and recommend applicable Indian Penal Code (IPC) or IT Act provisions. Citizens can upload supporting evidence, monitor complaint status continuously, and interact with assigned officers via the platform. For law enforcement personnel, a specialized dashboard facilitates efficient complaint management and response. This research examines current systems, highlights their limitations, and establishes the necessity for the proposed platform. While the system remains under development, this paper presents detailed design specifications and objectives.

Keywords: Smart Complaint Platform, Artificial Intelligence, Natural Language Processing, Complaint Classification, IPC Section Mapping, Digital Policing, E-Governance Integration

I. INTRODUCTION

Currently, filing police complaints requires citizens to visit stations personally, stand in queues, describe incidents to officers, and depart without knowing subsequent actions. This approach proves time-consuming, unclear, and discouraging, particularly for individuals already experiencing distress. Many potential complainants abandon the process entirely because it appears overly complicated.

While some online portals allow home-based complaint filing, which represents an improvement, most remain rudimentary. These systems accept complaints but provide little beyond basic submission functionality. They lack automatic categorization, intelligent departmental routing, and real-time complainant updates. Although complaints enter digitally, subsequent processing remains manual.

This research introduces a new approach: an AI-Enhanced Smart Platform for Complaint Management that processes complaints more intelligently and comprehensively. The proposed platform accepts complaints in text, audio, or video formats, automatically analyzes and categorizes them using AI, suggests relevant legal provisions, and maintains continuous updates for both citizens and officers throughout the process.

The primary objectives of this proposed system include: (1) creating a unified digital platform managing complete complaint lifecycles from submission through resolution; (2) implementing AI and NLP for automatic complaint classification and IPC section recommendations; and (3) supporting multiple input formats including text, audio, and video to ensure universal accessibility.

II. THEORETICAL BACKGROUND

It will be wise to look into the foundation for understanding how the AI-based digital justice system works before delving into each individual component of the system.



A. System model

The digital justice system can be described at the most basic level as an equation which connects user inputs and system processes to produce legal outputs.

$$O = f(U, S)$$

Where,

U - user input: complaint details, audio/video evidence, user info;

S - system component: AI module, database, police dashboard;

O - output: classified complaint type and legal sections.

The system works by taking in user complaints and analyzing them in order to generate relevant legal suggestions.

B. Workflow model

In order for a complaint to be processed, there are several stages to be completed; we can describe the process as follows:

$$W = (C, P, L, D, T)$$

Where,

W is the complete process;

C - complaint submission;

P - preprocessing and analysis using natural language processing techniques;

L - legal section prediction;

D - dashboard processing (authorities);

T - complaint tracking.

C. Data representation

The data on user complaints can be represented as a list of features.

$$D = \{d_1, d_2, d_3, \dots, d_n\}$$

Where,

d_i - features: complaint text, type of input (audio/text/video), location, time stamp, evidence file.

D. Performance metrics

Performance metrics that can be used to evaluate the effectiveness of the digital justice system include efficiency:

$$Efficiency = \frac{Processed\ Complaints}{Total\ Complaints}$$

Where Efficiency measures whether the system is able to analyze all complaints effectively.

E. Response time model

The response time for a system is made up of several parameters:

$$T = T_c + T_p + T_a + T_r$$

Where,

T - Total response time;

T_c - complaint submission time;

T_p - preprocessing time;

T_a - AI analysis time;

T_r - response generation time

F. Scalability

Scalability is the ability of a system to work well in response to changing load conditions; the system's scalability can be shown through:

$$S_c \propto N$$

Where,

S_c - system capacity;

N - number of users.



III. FOUR-TIER TAXONOMY

Understanding the proposed system's position requires comparing it with existing complaint systems. This taxonomy categorizes complaint management systems into four tiers based on sophistication and completeness.

Tier 1: Manual Complaint Systems

These systems operate entirely through manual processes. Citizens must visit police stations, complete paper documentation, and await responses. No digital access exists, automation is absent, and citizens have virtually no method for tracking case progress after initial submission.

Tier 2: Online Complaint Registration Systems

These platforms enable online complaint submission, eliminating station visits. However, digital functionality concludes at submission. After filing, citizens receive no updates and cannot track progress through the same platform.

Tier 3: Digital Complaint Management Systems

These advance further by incorporating case tracking, automated notifications, and centralized police dashboards. Workflow visibility improves significantly. However, complaint sorting remains manual, and systems typically accept only text input, excluding some user populations.

Tier 4: AI-Enhanced Smart Platform (Proposed)

The proposed system operates at this level, combining all lower-tier capabilities while adding AI-driven classification, automatic IPC section prediction, text/audio/video input support, and real-time tracking for both citizens and officers. This represents the most comprehensive complaint management approach described in current literature.

IV. LITERATURE REVIEW

The reviewed research encompasses recent studies on digital complaint systems, AI applications in legal contexts, and intelligent policing. A consistent finding across all studies indicates that while individual systems excel in specific areas, none provides comprehensive solutions covering entire complaint processes from initiation to completion.

Machine learning and NLP demonstrate strong performance in legal text classification and relevant law prediction. Blockchain-based systems enhance complaint record trust and security. E-governance platforms improve public service accessibility. However, each operates independently without integration. The proposed platform seeks to unify these capabilities within a single system.

TABLE I: LITERATURE REVIEW SUMMARY

Sl.	Author(s)	Year & Title	Method / Technique	Key Findings	Venue & Index
1	Kuppala J. et al.	2022 – AI in Legal Systems	AI, Data Analytics	Improved judicial efficiency and decision-making	IEEE MECON
2	Vignesh S. et al.	2024 – Blockchain Complaint System	Blockchain, Smart Contracts	Secure and tamper-proof complaint handling	IEEE AIMLA
3	Sarafis D. et al.	2024 – Complaint Management Systems	E-Governance Platforms	Automated routing and improved accessibility	IEEE EEENG
4	Alenezzy F. et al.	2023 – Fix-It System	Web + Mobile Application	Efficient complaint tracking and feedback system	IEEE ICCoSITE
5	Divya G. et al.	2024 – Crime Prediction	Machine Learning	Accurate crime pattern prediction and analysis	IEEE TQCEBT
6	Shilaskar S. et al.	2024 – IPC Prediction	NLP (Tokenization, Stemming)	Automated IPC section identification	IEEE IC-ETITE
7	Tomar M. et al.	2023 – Legal Case Classification	BERT, Machine Learning	High accuracy (~92.9%) classification	IEEE ICDSAAI



8	Patil P. et al.	2025 – AI Legal Assistant	NLP, Chatbot	Faster legal assistance and document processing	IEEE ICACT
9	Mudhiganti S. et al.	2025 – AI Risk Management	Generative AI, NLP	55% faster legal decision-making	IEEE AIC
10	Patil S. et al.	2025 – AI Case Analytics	ML, Predictive Analytics	35% reduction in case processing time	IEEE ICACT
11	Lovely J. et al.	2024 – Online Complaint System	Web-Based System	Easy complaint registration and coordination	IEEE AIMLA
12	Mudhiganti A. et al.	2025 – AI in Legal Services	AI, NLP	Improved automation in legal workflows	IEEE Conference

V. COMPARATIVE ANALYSIS

Examining all reviewed research collectively reveals clear patterns. Rather than analyzing individual papers separately, this section focuses on overall literature findings, highlighting both achievements and persistent challenges.

Nearly every reviewed system attempts to reduce in-person visit requirements. This represents widely accepted improvement for valid reasons: physical access requirements discourage reporting and limit public service reach. Transitioning complaint submission online represents a necessary step most researchers support.

AI and machine learning tools demonstrate clear utility in legal domains. Studies employing NLP for text classification and IPC prediction show measurable speed and accuracy improvements. Evidence across multiple papers strongly supports AI implementation in complaint processing.

The most significant weakness involves system disconnection. Platforms accepting complaints rarely classify them automatically. Systems classifying complaints typically lack tracking features. Legal tools almost always operate separately from complaint pipelines. This forces citizens to navigate multiple disconnected systems, creating confusion and inefficiency.

Additional recurring problems include: exclusive text input support (excluding many users), absence of real-time post-submission updates, inconsistent privacy protections, and non-scalable architectures. These represent substantial rather than minor issues, limiting practical system utility.

TABLE II: COMPARATIVE ANALYSIS OF REVIEWED SYSTEMS

Sl.	Paper	Protocol / Technique	Performance	Advantages	Limitations
1	Kuppala et al.	AI-based data analysis	High	Improves judicial efficiency and decision-making	No complaint interface
2	Vignesh et al.	Blockchain + Smart Contracts	High	Secure and tamper-proof system	No AI-based classification
3	Sarafis et al.	E-Governance platform	Moderate	Improves accessibility and complaint routing	No automation or intelligence
4	Alenezzy et al.	Web + Mobile system	High	Easy complaint registration and tracking	No NLP integration
5	Divya et al.	Machine Learning	High	Predicts crime patterns effectively	No user-facing complaint system
6	Shilaskar et al.	NLP (Tokenization, Stemming)	High (~85%)	Automated IPC prediction	Limited to text input
7	Tomar et al.	BERT, Deep Learning	Very High (~92.9%)	Accurate legal classification	Limited domain scope



8	Patil et al.	NLP + Chatbot	High	Fast legal assistance and support	Not a full complaint system
9	Mudhiganti et al.	Generative AI + NLP	High	Faster legal decision-making (~55%)	Complex implementation
10	Patil & Desai	ML + Predictive Analytics	High	Reduces case processing time (~35%)	Requires large datasets
11	Lovely et al.	Web-based complaint system	Moderate	Simple and user-friendly interface	No intelligence or automation
12	Mudhiganti et al.	AI + NLP systems	High	Improves legal workflow automation	Limited integration

VI. RESEARCH GAP

Based on literature review and comparative analysis, the following gaps exist in current systems. These gaps directly justify developing the proposed platform.

Gap 1: Absence of Complete End-to-End Platforms

Existing systems handle only individual complaint process components: submission, classification, tracking, or legal advice. No current system combines all elements into a single platform. This represents the primary gap the proposed system addresses.

Gap 2: Exclusive Text Input Support

Nearly all existing systems accept only typed text. This problematizes users who prefer speaking or video recording, especially in areas with lower literacy rates. The proposed system will support audio and video inputs additionally.

Gap 3: Excessive Manual Processing Requirements

Many platforms depend on human-based complaint sorting and routing. This slows processing and creates inconsistency. The proposed system will automate this step using AI.

Gap 4: Absence of Real-Time Citizen Tracking

After complaint submission on most platforms, citizens cannot determine case status. They must telephone police stations or visit personally for updates. The proposed system will include live case tracking ensuring continuous citizen information.

Gap 5: Inadequate Data Security Practices

Legal complaint data requires secure storage due to sensitivity. Many reviewed systems lack clear evidence of proper data management or privacy measures. The proposed system will incorporate secure storage as a fundamental requirement.

Gap 6: Limited Scalability

Most systems underwent small-scale testing and cannot handle city-wide or state-wide volumes. The proposed system will incorporate scalability considerations from initial design phases.

Gap 7 - Lack of Standardized Protocols

Current systems operate with completely different internal structures, which prevents them from communicating effectively with one another. Our proposed solution will be designed around established standards, enabling future integration with other government platforms.

Gap 8 - Absence of Legal Support for Citizens

Citizens often struggle to understand which laws relate to their specific complaints when filing reports. Current platforms provide no assistance in this area. Our proposed system will feature an AI component that analyzes complaint details and recommends appropriate IPC sections.

VII. CONCLUSION

This paper has examined existing digital complaint management systems and highlighted key shortcomings. Although current platforms represent progress from completely manual methods, they fail to deliver a comprehensive, intelligent, and accessible experience for both citizens and law enforcement.



Our response to these shortcomings is an AI-Integrated Smart Platform for Complaint Management, which remains in development. When completed, this system will enable citizens to file complaints using text, audio, or video inputs, obtain AI-powered recommendations for relevant IPC sections, monitor case progress continuously, and maintain direct communication with assigned officers through one unified digital platform.

Security and scalability form the foundation of our design approach rather than being added later. The multi-format input capability will create greater accessibility than any existing solution. The integrated legal recommendation tool will eliminate much of the uncertainty citizens experience when unsure about applicable laws.

Upcoming development phases include system construction and testing, AI model optimization, and integration with India's current e-governance systems. Additional features under consideration include multi-language functionality, an AI-powered chatbot for immediate legal assistance, and analytical tools to support strategic resource deployment in law enforcement.

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