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High-Level Automation on FIR System

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Abstract

Filing a First Information Report (FIR) is an essential step in starting criminal investigations, but current procedures in India frequently experience manual delays, restricted accessibility, and insufficient transparency. This document presents an advanced automated FIR system that enables users to submit complaints via an online web interface, eliminating the need to go to police stations. Inspired by recent advancements in blockchain FIR systems for secure storage [1]–[3], legal regulations regarding FIR evidential importance [4], and AI-driven FIR creation with speech and NLP technologies [5], this study streamlines the procedure for citizens and law enforcement. The suggested system facilitates safe user registration, online filing of FIRs, and instant status monitoring via unique IDs. Without delving into intricate blockchain or AI integrations, it emphasizes ease of use and swift access, particularly for users in rural areas or those with mobility limitations. In contrast to hybrid blockchain-AI frameworks [6], this system emphasizes crucial automation functionalities to enhance complaint precision, lessen reliance on manual processes, and build greater trust in digital policing services. The result is a streamlined, easy-to-use solution that enhances clarity, effectiveness, and public engagement in FIR submission procedures. The system features an intuitive web-based interface that caters to both complainants and police officers, facilitating easy navigation and dependable information exchange. In contrast to models that rely heavily on blockchain or are complicated by AI, this strategy emphasizes user engagement and real-time oversight via simple digital accessibility. Dependable information exchange. In contrast to models that rely heavily on blockchain or are complicated by AI, this strategy emphasizes user engagement and real-time oversight via simple digital accessibility.

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Keywords

FIR automation, online complaint system, digital policing, real-time monitoring, citizen services, secure access, smart governance, FIR filing system, transparency, law enforcement technology.

1 Introduction

The First Information Report (FIR) is the essential starting point for launching a criminal investigation in India. Typically, FIRs are filed by hand at police stations, frequently leading to tedious paperwork, delays, and difficulties in accessibility, particularly in distant or rural regions. These obstacles have historically led to inefficiencies, incorrect reporting, and public discontent with law enforcement practices. As the need for digital public services grows, automating the FIR process has become essential for guaranteeing prompt access to justice and enhanced governance. Recent research has suggested several improvements to the FIR registration system through the use of new technologies. Solutions based on blockchain technology have been utilized to tackle data manipulation and guarantee secure, traceable records [1]–[3], whereas AI models provide automation via speech-to-text and natural language comprehension to ease the process of filing complaints [5]. Additionally, legal research has emphasized the significance of preserving the evidentiary worth of FIRs via transparent and secure management [4]. In this initiative, we suggest a web-based FIR automation system that allows citizens to file complaints online, get immediate acknowledgment, and monitor the status of their case without having to go to a police station in person. The platform is created to be accessible and user-friendly, offering an easy user experience while preserving essential features like secure registration, distinct case identification, and administrative access for permitted officers. The aim is to enhance the speed, accessibility, and transparency of FIR registration, while preparing for possible future integrations of blockchain security and AI-driven analysis. This study offers a feasible and expandable approach to enhancing police-publicrelations and aids in the wider objective of digital governance and intelligent law enforcementintegrations of blockchain security and AI-driven analysis. This study offers a feasible and expandable approach to enhancing police-public relations and aids in the wider objective of digital governance and intelligent law enforcement.

2 Literature Survey

Gopal, A., Vishwakarma, A., and Mishra, R. (2022): The authors suggesr SmartFIR, a blockchain-based system that secures FIR data using Ethereum smart contracts. They emphasize the importance of immutability and transparency, using SHA-based hashing to maintain data integrity. Their work focuses on preventing false FIRs and unauthorized access, showing that decentralized technologies can improve trust in digital police processes.

- **Chaudhari, S., Deshmukh, S., and Bhide, A. (2024):** This team presents a FIR Management System leveraging private blockchain and cloud integration. They highlight the importance of encryption (MD5 and RSA) and modular architecture to ensure secure and scalable handling of complaint data. The authors advocate for hybrid solutions that prioritize usability, encryption, and performance in real-world FIR systems.
- **Jha, A., and Kumar, R. (2023):** The authors introduce a blockchain-driven FIR Security System with a focus on SHA-256 hashing, smart contracts, and role-based access. Their work includes judicial modules, allowing courts to verify the FIR lifecycle, and underlines the need for integrated, tamper-resistant mechanisms that extend beyond filing into case tracking and evidence validation.
- **Charan, J.L., Kalpana, S., and Naidu, S.T. (2023):**This legal review analyzes the evidentiary role of FIRs in the Indian justice system. The authors explain that FIRs are not substantive evidence but are crucial for corroboration in trials. They point out procedural flaws like coercion and false reporting and recommend technological reforms such as blockchain and digital systems for improving reliability and transparency.
- **Chaudhari, A., Deshmukh, O., and Amborkar, B. (2024):**The team presents an *AI-powered FIR filing system* that uses ASR and NLP to automate FIR creation from voice input. BERT and GPT-3.5-turbo models are used to map legal clauses and generate structured FIRs. The authors stress improved accessibility, language support, and reduced manual work as key benefits of intelligent automation in FIR systems.
- **Dhone, D., Elinje, P., and Chaudhary, A. (2023):**These authors develop *Cryptoshield*, a secure blockchain FIR platform with Aadhaar-based verification and key-pair encryption. They propose features such as evidence uploads, key revocation after resolution, and officer role management. Their work addresses corruption and trust issues in FIR handling, promoting blockchain as a tamper-proof foundation for criminal case records.

3 Proposed Methodology

The suggested method for the FIR Automation Case File System seeks to modernize the filing of First Information Reports by implementing a digital framework that replaces the traditional manual method. The system is built to be reachable via both web and mobile platforms, enabling users to submit complaints from anywhere at any moment. After logging in with their unique credentials, users are directed to provide crucial details including their name, contact information, and specifics of the incident. Upon submission, a distinct FIR identification number is created for tracking. The foundation of the system consists of multiple interlinked modules. The online portal acts as the main platform for users to file complaints, provide supporting documents, and track the progress of their cases. To promote inclusivity and expand accessibility, a mobile app supplements the web platform, allowing users to submit FIRs straight from their mobile devices and obtain real-time notifications. In regions with poor internet access, an SMS-based FIR registration option is included, enabling complainants to file reports via formatted text messages. The system automatically handles these messages and provides a confirmation together with the FIR ID. To improve accessibility for those who are visually impaired or unable to read, an Interactive Voice Response (IVR) system is implemented, enabling users to submit complaints using voice prompts. Furthermore, a chatbot feature is integrated into both web and mobile platforms to gather information interactively and simplify the data entry procedure. All grievances are safely kept in a central database that is accessible solely by authorized law enforcement officials. This backend system enables efficient case management and guarantees that every complaint is handled swiftly according to its type and seriousness.

Admin side functionality:

- Only authorized personnel can access the admin panel using secure credentials.
- Displays all submitted FIRs with associated metadata such as date, category, location, and status.
- View full complaint details including user information, supporting documents, and timestamps.
- Update the status of cases (e.g., Pending, In Progress, Resolved, Closed).

4 Implementation

The FIR Automation System was developed with a web-based framework, utilizing HTML, CSS, and JavaScript for the frontend, and PHP along with MySQL for backend processing and data storage. The admin panel was designed to facilitate secure login, real-time tracking of complaints, and management of users.

4.1 Technological Stack

Frontend: HTML5, CSS3, JavaScript, and React.js are employed to create an interactive and responsive user interface.

Backend: Node.js along with Express.js manages server-side logic and routing.

Database: MongoDB serves as a NoSQL database for storing and accessing business data in a scalable and adaptable manner.

Machine Learning: Python-driven ML models are connected via REST APIs to provide data-informed insights like sales forecasting and inventory predictions.

Security: User verification is managed through JSON Web Tokens (JWT), while role-based access control (RBAC) guarantees authorization throughout various modules.

4.2 Development of the Module

User Registration and Login Module:

This module manages user authentication and the creation of accounts. It employs secure login information and encryption to safeguard sensitive data. A verification system guarantees that only authorized users can enter the platform.

FIR Submission System:

Users are able to file FIRs by sharing details of the incident, attaching evidence, and choosing case categories. The form information is checked in real-time and saved in a structured database format after submission.

Admin Management Section:

Admins can access, delegate, modify, and resolve complaints via a specialized dashboard. This module contains features for search filters, complaint history, and officer assignment.

Status Monitoring Component:

This enables users to monitor the status of their complaints via the unique FIR ID. Changes implemented by the dministrator appear instantly and are accessible to users via their dashboards.

Alert System:

Incorporated with Firebase or Twilio APIs, this module transmits SMS and email notifications to users at important phases of case handling (e.g., FIR received, allocated, or concluded).

4.3 Integration and Examination

The integration stage cantered on effortlessly linking all separately created modules—user interface, complaint logging, administrative management, and automated communication—into a cohesive and smart system. A service-oriented architecture (SOA) was implemented to facilitate seamless data transfer between the frontend and backend parts. RESTful APIs connected the client interfaces to the server, enabling real-time updates and secure data exchanges. After the integration was finished, a methodical evaluation phase was conducted to confirm the system's integrity, efficiency, and automation functions. Every module was subjected to unit testing to verify its specific performance, and this was succeeded by integration testing to guarantee efficient interaction among the modules. Particular attention was given to evaluating the automation capabilities including auto-creation of FIR IDs, automated status alerts, and chatbot-assisted complaint management.

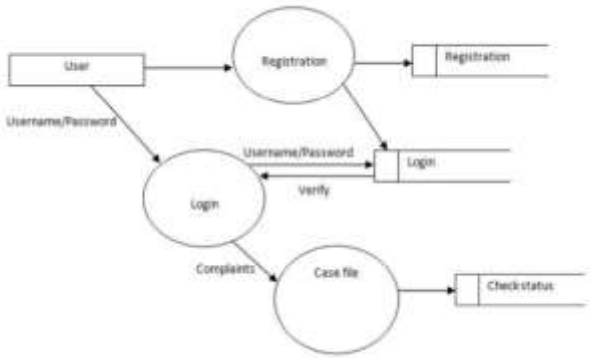

Figure 1. Workflow of FIR Automation System

Steps and Flowchart:

The sequential flow of the system is outlined as follows:

Step 1: The user launches the FIR Automation web application. This can be reached through any web browser on a computer or mobile device. The homepage offers straightforward navigation choices for both new and returning users.

Step 2: The user chooses the Registration option. This enables new users to set up an account on the platform. The registration guarantees that only confirmed individuals are allowed to file complaints.

Step 3: The user provides personal information (name, address, gender, email, phone number, case type) and sends the registration form. The form is checked for accuracy and thoroughness prior to being submitted. After submission, the information is safely stored in the system's database.

Step 4: The system creates a distinct User ID and Password. These credentials are utilized for subsequent logins to preserve case access. The credentials could be sent via email or shown right away on the screen.

Step 5: The user accesses the system with the given credentials. The system checks the login details for verification. Upon a successful login, the user is taken to the complaint dashboard.

Step 6: The user opts to submit a complaint by providing necessary information. Information might encompass a description of the incident, its location, and the date and time. The interface might also permit the upload of relevant documents or images.

Step 7: The system handles the complaint and generates a FIR entry in the case file system. Every entry is marked with a time stamp and labeled with metadata for monitoring. The complaint is automatically assigned to a police officer or department.

Step 8: An exclusive FIR Number is created and allocated to the complaint. This number acts as a reference for all upcoming communications. The FIR number is shown on the screen and dispatched through SMS/email for reference.

Step 9: The user is able to monitor the complaint's status with the FIR Number. The system reveals notifications such as "Under Review", "In Investigation", or "Closed". Users may get notifications through email/SMS as the situation advances.

Step 10: Officials are able to assess, handle, and modify the case file whenever necessary. Officers may input

investigation notes, designate teams, or seek further information. Every action is recorded for clarity and auditing reasons.

5. CONCLUSION

The mechanization of FIR systems in India is a revolutionary change from manual, paper-based processes to sophisticated, technology-enabled platforms. Top-level automation — specifically through blockchain and hybrid cloud technologies — makes complaint records transparent, immutable, and readily accessible in real-time, greatly increasing trust, efficiency, and security in law enforcement processes.

Although FIRs are not substantive evidence, their value in corroborating or refuting testimonies at trial is invaluable. Nevertheless, procedural vulnerabilities like coercion, misreporting, and undue delays continue to undermine the validity of FIRs. Automated filing of FIRs using secure platforms can overcome these vulnerabilities by providing tamper-proof, dated complaint records, remote access, and objective handling of sensitive information.

Technologies such as blockchain enable decentralized, tamper-evident data storage, while integration with the cloud enables scalability and accessibility, allowing important information to be secure yet easily accessible. The addition of accessible web interfaces closes the gap between law enforcement and the general public, fostering a more level and accessible system of justice.

Going forward, inter-institutional cooperation among legal institutions, technologists, and policymakers will be needed to deploy these innovations at scale, with the long-term vision of a more equitable, accelerated, and accountable FIR management ecosystem.

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