

Community Crime Reporting and Alert System

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1. ABSTRACT

The Community Crime Reporting and Alert System is a web-based application designed to facilitate real-time crime reporting and awareness through modern web technologies. Built using HTML, CSS, JavaScript (React.js or Vue.js for frontend), and Node.js with Express.js for backend, the system ensures a seamless user experience. It employs MongoDB or MySQL as the database to store user reports, authentication details, and crime statistics securely. The system supports user authentication (JWT or OAuth 2.0), allowing registered users to report crimes while also providing an option for anonymous submissions. Reported incidents include key details such as crime type, description, date, time, and location, which are stored in the database and visualized on an interactive Google Maps API integration.

2. INTRODUCTION

The Community Crime Reporting and Alert System is designed to streamline the process of reporting crimes and disseminating alerts in a community. This system aims to improve communication between residents and local authorities, enabling swift responses to incidents and enhancing public safety. To purge the element of criminal behaviour from society, reporting crimes helps in pursuing justice and social reform. The project seeks to leverage the power of technology to streamline the process of reporting crimes, thereby enhancing public safety and facilitating swift action by law enforcement agencies. In addition, the portal will offer helpful tools and data to assist users in staying updated about local support services, safety advices. No formal knowledge is needed for the user to use this system and hence it proves it is user friendly. In conclusion, the Crime Awareness and Report Portal project is a major advancement in the use of technology to improve public safety and fight crime.

3. LITERATURE SURVEY

3.1. Mobile-Based Crime Reporting and Management system .

R. S. Thakur, P. S. Patil

This study presents a mobile-based application designed to simplify the crime reporting process. The app allows citizens to report crimes instantly with multimedia support (images, videos, GPS location). Police officers can receive and manage reports in real time. Supports the concept of real-time reporting and alert generation. It also highlights user interface and backend design considerations for mobile platforms in crime reporting.

3.2 Crime Mapping and Analysis Using GIS

S. Sharma, A. Kapoor

This research focused on integrating Geographic Information Systems (GIS) for mapping crime data. The goal was to identify crime hotspots and trends over time. Offers insight into spatial analysis for crime alerts and can be integrated into your system to visualize reported crime data effectively.

3.3. SMS Based Citizen Reporting System

N. D. George, K. O. Emuoyibofarhe

A system that uses SMS for crime reporting in rural areas with limited internet access. It emphasizes low-cost infrastructure and includes an alert mechanism for nearby users Useful for designing features for areas with poor internet connectivity, expanding accessibility, and creating a broader alert dissemination model

3.4. Design and Implementation of a Web-Based Crime Reporting System

T. A. Adeyemo, M. O. Ibidapo

This paper details the development of a secure web application that allows anonymous and verified crime

reports. It includes admin modules for crime classification and alert generation. Highlights the backend system logic and database design for efficient handling and categorization of user-generated crime reports.

3.5. Community Policing Through ICT: A Case Study

J. C. Okafor, E. N. Ez

The paper analyzes how ICT tools can enhance community policing by improving communication between police and citizens. It discusses mobile apps, email, and push notifications. Supports your project's goal of strengthening the link between community members and law enforcement using ICT-based solutions.

4. METHODOLOGY

4.1 System Design: The System Design outlines the overall architecture of the application, breaking down how the components interact and function together.

- **Frontend:** A responsive web interface built with HTML, CSS, and JavaScript (using Bootstrap for responsive design).
- **Backend:** A RESTful API developed using Python and the Flask framework. It handles user authentication, report submission, notification and data management.
- **Database:** A relational database (e.g., SQLite for testing, PostgreSQL for production) that stores user data, crime reports, and other necessary information.
- **Notification Service:** An integration with email (SMTP) and SMS (Twilio) for sending alerts to users.
- **Maps Integration:** Uses the Google Maps API or Folium library for geospatial data visualization.

4.2 System Workflow:

a) User Registration/Login:

- Users register or log in to the system. Passwords are hashed for secure storage.

b) Crime Report Submission:

- A user submits a crime report with details (e.g., crime description, type, location).

c) Admin Review:

- The admin panel allows administrators to review, verify, or reject reports.

d) Notification and Alerting:

- Users receive notifications based on the proximity of the crime to their location (via email or SMS)

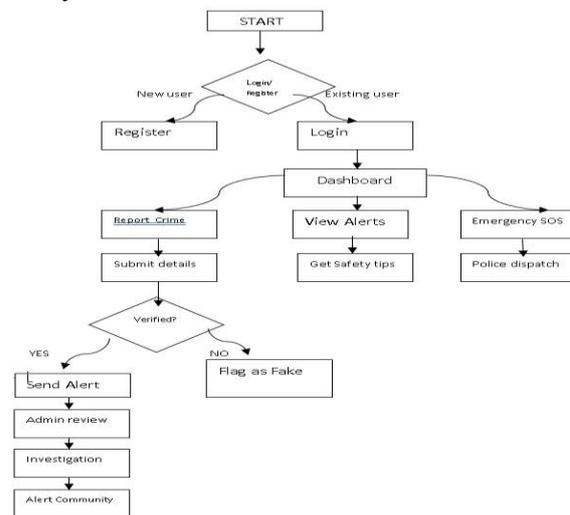
e) Map Visualization:

- The map displays crime locations interactively, with clickable markers for additional details.

4.3 Scalability and Future Enhancement:

- The system can scale to accommodate a large number of reports and users by migrating the database from SQLite to PostgreSQL or a cloud-based solution (e.g., AWS RDS).
- Future enhancements could include real-time push notifications (e.g., using Firebase), AI-based crime prediction using historical data, and mobile app support.

4.6 System architecture



5. IMPLEMENTATION AND RESULTS

5.1 System Development:

The System Development of the Community Crime Reporting and Alert System involved creating a user-friendly web application using Python and the Flask framework. The development process included setting up the backend with a SQLite database, implementing user authentication, and allowing citizens to submit crime reports with details like crime type, description, and location. The system featured an interactive map to display crime locations and integrated email/SMS notifications for alerts. Admins were given access to a panel for verifying and managing reports. The frontend was built with HTML, CSS, and Bootstrap for a responsive design, ensuring ease of use on all devices.

Security: Security was considered throughout development. Passwords were hashed using bcrypt for secure storage. Input fields were sanitized to prevent

SQL injection and XSS attacks. The application included role-based access control, ensuring that only authorized users could access admin feature

5.2 System Testing

- **Unit Testing:** Individual components of the system, such as form validation, report submission, and database interactions, were tested independently. Unit tests were written using pytest or unittest to verify the correctness of core logic, such as checking if the crime report data is stored correctly, validating user inputs, and ensuring password encryption worked properly. These tests helped identify any issues in specific components early in the development process.
- **Integration Testing:** After unit tests, integration testing was performed to ensure that various modules of the system worked together as expected. This included verifying that the crime reports were correctly passed from the form to the backend database, and that the map integration displayed the correct geolocation of the reports. Additionally, email/SMS notifications were tested to ensure the system sent alerts to users in real time.
- **User Acceptance Testing:** In this phase, the system was tested by a small group of end-users to ensure it met their expectations and functional requirements. Users tested the system's crime reporting functionality, the admin panel for report management, and the map-based crime visualization. Feedback from UAT was gathered and used to make adjustments to the UI/UX, ensuring the system was intuitive, easy to use, and met all user needs.

5.3 RESULTS

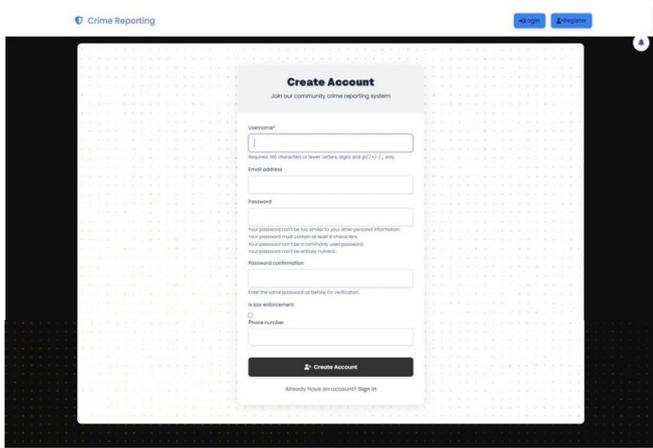


Fig 1. Registration page

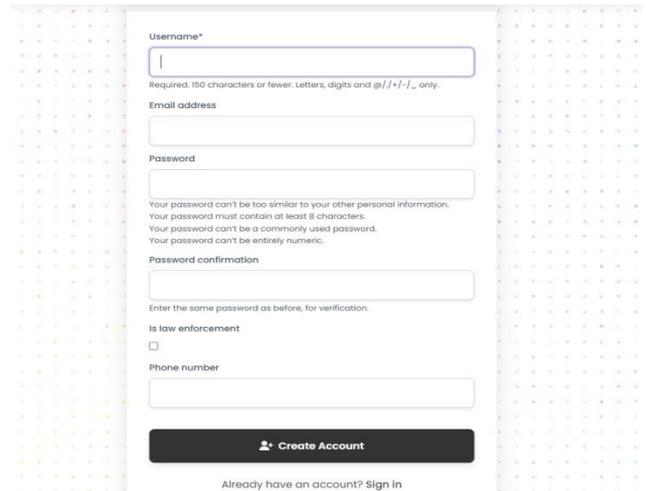


Fig 2. Login page

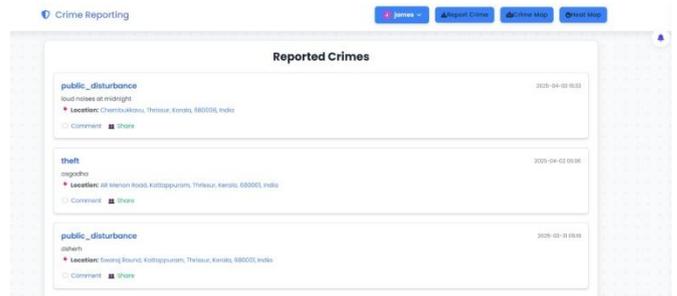


Fig 3. Home page Law Enforcement User

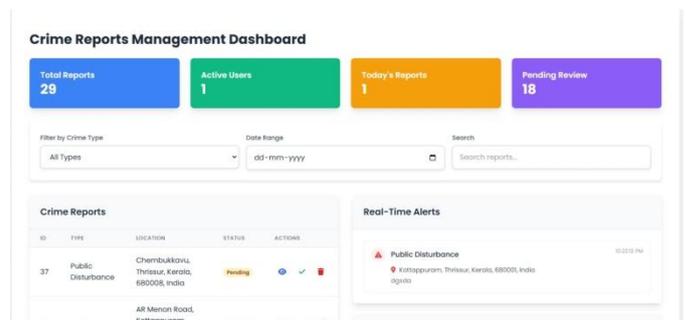


Fig 4. Dashboard-Law Enforcement User

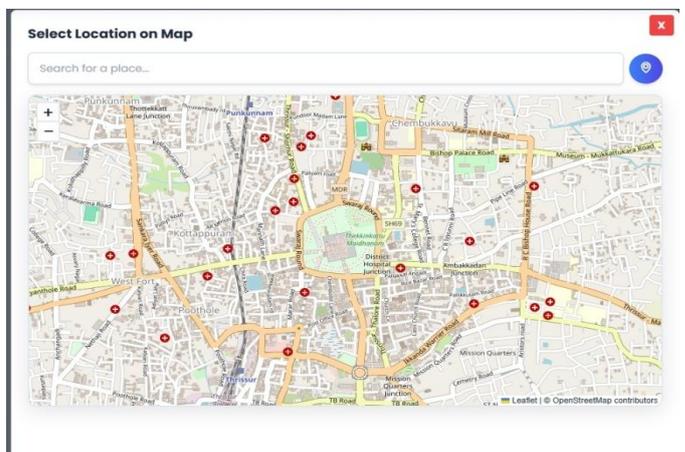


Fig 5. Crime Map

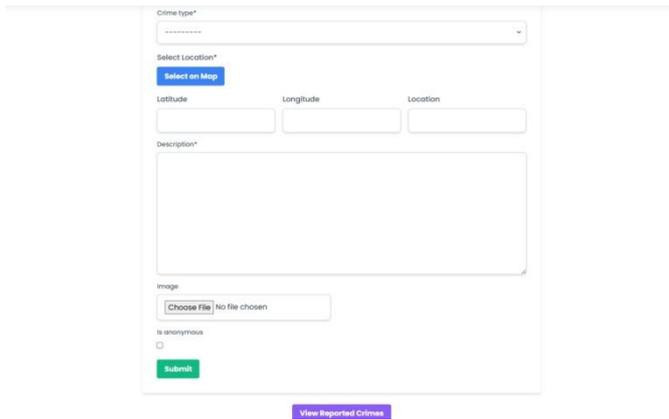


Fig 6. Crime reporting Page-Normal User

6. CONCLUSIONS

The project Community Crime and Alert System was handed to us at the end of the semester, and we were instructed to develop a website for the same using Django. In order to complete this project, we explored several online resources and referred to multiple books on Software Development, Django, and SQL databases. While studying these resources, we expanded our knowledge beyond what was covered in our academic coursework. Through this project, we have gained a deeper understanding of integrating Django with databases, implementing security features, and developing an online platform to report crimes. The hands-on experience of building this system has significantly improved our technical skills. Now, we are confident in developing web applications based on specific requirements, and this has been made possible through the completion of this project.

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