AI POWERED CRIME REPORTING AND ANALYSIS WITH SOCIAL FEATURES AND PREDICTIONS

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ABSTRACT

In today's era of rapid technological advancement, every sector is experiencing rapid transformation through intelligent systems, data analytics and AI integration. However, public safety and crime prevention sectors still face challenges in integrating modern AI capabilities and real-time community engagement, especially in countries like Pakistan where such systems are scarce. Many existing crime reporting platforms from other countries are also limited in scope, offering isolated functionalities such as incident mapping or anonymous tip submission, but fail to provide an integrated, user-friendly experience that bridge the gap between citizens and law enforcement. Another problem with the existing system is that they are either designed solely for law enforcement agencies or only for public use, creating an efficiency gap that undermines their overall impact. We have proposed an AI-driven crime reporting and analysis web platform that empowers citizens to report incidents, help track missing persons, provide crime pattern visualizations, and support law enforcement through AI-generated structured insights. Additionally, the platform features social feed, location-based filters, and alerts via SMS and email. Users can explore dynamic heat maps and statistical dashboards- filtered by city, crime type, and time range to gain timely situational awareness. By combining Artificial Intelligence technologies and a dynamic web-based interface, the system will empower communities to contribute actively toward the safety while enabling authorities to access intelligent crime trend prediction and smarter decision-making tools. The proposed platform will be accessible, efficient and locally relevant, fostering a new era of transparency, collaboration, and proactive crime management within Pakistan.

CERTIFICATE

Dated: _____

Final Approval

It is certified that the project report titled **'AI POWERED CRIME REPORTING AND ANALYSIS WITH SOCIAL FEATURES AND PREDICTIONS'** submitted by **Syed Ain Ali Hussnain**, and **Syed Ali Taqi Hussnain** for the partial fulfillment of the requirement of **"Bachelor's Degree in Software Engineering"** is approved.

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DECLARATION

We hereby declare that our dissertation is entirely our work and genuine/original. We understand that in case of discovery of any PLAGIARISM at any stage, our group will be assigned an F (FAIL) grade and it may result in withdrawal of our Bachelor's degree.

Group Members	**Signature**
1. Syed Ain Ali Hussnain	_____
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Introduction

Over the past few decades, technology has evolved a lot and has become an important part of almost every field. From healthcare to education, transport to communication, intelligent systems and Artificial Intelligence (AI) are bringing new and better ways of doing things. In today's world, people prefer faster, smarter, and more accessible solutions to their daily problems.

But even with these advancements, the areas of public safety and crime prevention are still facing many challenges. AI based crime reporting systems are non-existent anywhere in the world but the gap is even bigger in Pakistan since there is no proper system for citizens to report crimes at all. This causes delay in reporting, less awareness among people and slower responses from authorities.

To help solve this problem, we are proposing an AI-powered crime reporting and analysis web platform designed specifically for Pakistan. Our system will allow citizens to report crime easily, view local crime activities, and get real time alerts. At the same time, government officials will have access to structured AI-based reports, crime trend analytics, and useful dashboards for better planning and decision making. Integrated intelligence-led crime analysis and structured information management are essential for enhancing the effectiveness of law enforcement operations [1].

Although there are some crimes reporting systems available internationally, most of them are limited in scope. Some are made only for law enforcement agencies without public participation, and others allow public reporting but do not offer real analysis or pattern detection. Moreover, these systems are mostly not available or suitable for Pakistan.

1. Existing Systems

Existing systems in this domain only offer crime reporting or public safety alerts but most of these systems do not have easy public accessibility, real time analytics or integration with modern AI technologies. In terms of scope, most solutions handle only one aspect such as incident mapping, crime reporting or anonymous tip submission without integrating them into a single unified and intelligent interface that can help both citizens and law enforcement.

1.1. VALCRI

VALCRI (Visual Analytics for Sense-making in Criminal Intelligence Analysis) is an advanced crime analysis system [2]. It helps investigators in analyzing the criminal databases through interactive visual tools. Originally developed under the direction of Middlesex University, the VALCRI project was acquired in 2019 by Genetec [3], a Canadian based security company.

1.1.1. Features

- Combines data from multiple data sources for comprehensive analysis.
- Uses Machine learning to identify patterns and correlations.
- Present complex data in form of interactive visualization such as maps and timelines.

1.1.2. Limitations

- Designed only for law enforcement.
- Does not support real time citizen reporting or alerts.
- Not implemented in Pakistan

1.2. Auror

Auror is a platform that focuses on preventing retail crime by connecting retailers and law enforcement [4]. It was created in 2014 by Phil Thomson, James Corbett and Tom Batterbury.

1.2.1. Features

- It allows retailers to report incidents quickly.
- Share information with law enforcement to track and identify repeat offenders.
- Provide analytics to understand crime patterns in retail environments.

1.2.2. Limitations

- Designed only for retail crimes.
- Limited to a specific sector lacking broader community involvement
- General public cannot report crime or use the system.
- Not developed for Pakistan.

1.3. Pakistan Citizen Portal

Pakistan Citizen Portal is a mobile application that is launched by government, aimed at providing a communication channel between citizens and government departments [5]. It was launched in October 2018 by the Prime Minister's Performance Delivery Unit (PMDU) to resolve complaints and improve governance through citizen feedback.

1.3.1. Features

- Allow citizens to lodge complaints regarding government services.
- Support feedback and tracking of complaints through dashboard.
- Offers Complaint escalation if issue remain unresolved.
- Available and developed for Pakistan.

1.3.2. Limitations

- Submitted reports are not accessible to the public, resulting in limited public awareness and collaboration.
- Lacks AI-based analytics, real-time safety alerts, and predictive crime pattern detection.

1.4. P3 Tips

P3 Tips is a platform that enables the public to submit information to law enforcement agencies anonymously [6].

1.4.1. Features

- Enable secure and anonymous communication
- Supports attaching Multimedia with tips
- Facilitate two-way dialogue between tipster and law enforcement

1.4.2. Limitations

- Submitted tips or incidents are not accessible to public
- Lacks analytical tool for automated pattern recognition or trend analysis
- Not available for Pakistan

1.5. CrimeMapping

CrimeMapping is the most widely used platform that visualizes crime data obtained from law enforcement agencies on interactive maps [7]. It was first launched on July 8, 2008, by The Omega Group and is now part of the CentralSquare Technologies.

1.5.1. Features

- Visualize most recent six months of criminal activity on interactive map
- Allow users to filter data by crime type, date and geographic area
- Allow users to generate charts and report of data

1.5.2. Limitations

- Relies solely on law enforcement and there is no feature for civilian crime submissions
- Lacks AI based capabilities and predictive analysis
- Is not developed for Pakistan

1.6. Comparison between Existing Systems and Proposed System

Table 1 : Comparative Analysis among Existing Systems and Proposed Systems

Sr.	Criteria	VALCRI	Auror	Pakistan Citizen Portal	P3 Tips	CrimeMapping	Proposed System
1.	Public Interaction	No	Limited	Limited	Limited	No	Yes
2.	AI Integration	Yes	Yes	No	No	No	Yes
3.	Citizen Reporting	No	No	Yes	Yes	No	Yes
4.	Predictive Analysis	Yes	Limited	No	No	No	Yes
5.	Official Data Support	Yes	Yes	Yes	No	Yes	Yes
6.	Visualization Tools	Yes	No	No	No	Yes	Yes
7.	Public Accessibility	No	Limited	Yes	Yes	Yes	Yes
8.	Availability in Pakistan	No	No	Yes	No	No	Yes

2. Problem Description

Despite the availability of several crime related platforms globally, existing systems suffer from key limitations that impact their effectiveness and accessibility. Many of the existing systems are narrowly focused, serving only specific stakeholders such as law enforcement or the retail sector, while excluding meaningful engagement from the public. Although some of these systems allow limited input from the public, they lack structured data processing, real time analytics or AI capabilities that could generate reports to help law

enforcement agencies. Others focus on visualizing official crime data but do not offer the ability for public users to report incidents or contribute timely updates.

Additionally, most of these existing systems fail to offer an integrated dashboard that fosters connection between the public and law enforcement agencies in a unified environment. In context of Pakistan, these existing systems are either unavailable or inaccessible, as they are developed for foreign infrastructure and have not been adopted locally. There is currently no centralized or widely adopted system in Pakistan that enable both citizen and authorities to work together in raising awareness, improve transparency or effectively reducing crime.

3. Project Objective

Main objective of our project is to address the gap between the citizen and law enforcement in Pakistan by promoting transparent, accessible and community driven crime reporting. The system will leverage AI to refine crime data and support smarter decision making while ensuring the public stays informed.

4. Proposed System

We intend to develop an AI- powered crime analysis and reporting web platform that serves both citizens and law enforcement in Pakistan. Through a public portal, users will be able to submit incident reports with optional images, track local crime activity on interactive maps and receive timely alerts. Registered users will enjoy a social media style feed with features like filters, likes and comments, and anonymous posting while government officials access a secure, role-based dashboard featuring structured, AI-enhanced reports, trend analytics, and real-time status updates.

4.1. Features

- Public Reporting Web Portal
- Social Feed
- AI-Assisted Reporting
- Missing Person Reporting

- Real-Time Alerts
- Interactive Heatmap & Statistics
- Advanced Search and Filtering
- Official Dashboard

4.2. Expected Results

- **Higher Public Engagement** in crime reporting and community safety
- **Faster Awareness and Response** through automated alert and real time feed
- **Enhanced Situational Insights** via heatmaps and trend analytics
- **Improved Data Quality** with AI generated structured report

4.3. Possible Extension

If time permits, we plan to implement a Duplicate Detection feature that will utilize AI to recognize similar crime reports based on submitted text and images, helping to minimize spam and redundant entries.

5. Modules

5.1. Crime Reporting

This allows registered users to report crimes with text, location, and images and it is integrated with AI for automatic report generation, which can be shared on social media.

5.1.1. Flow chart of Crime Reporting

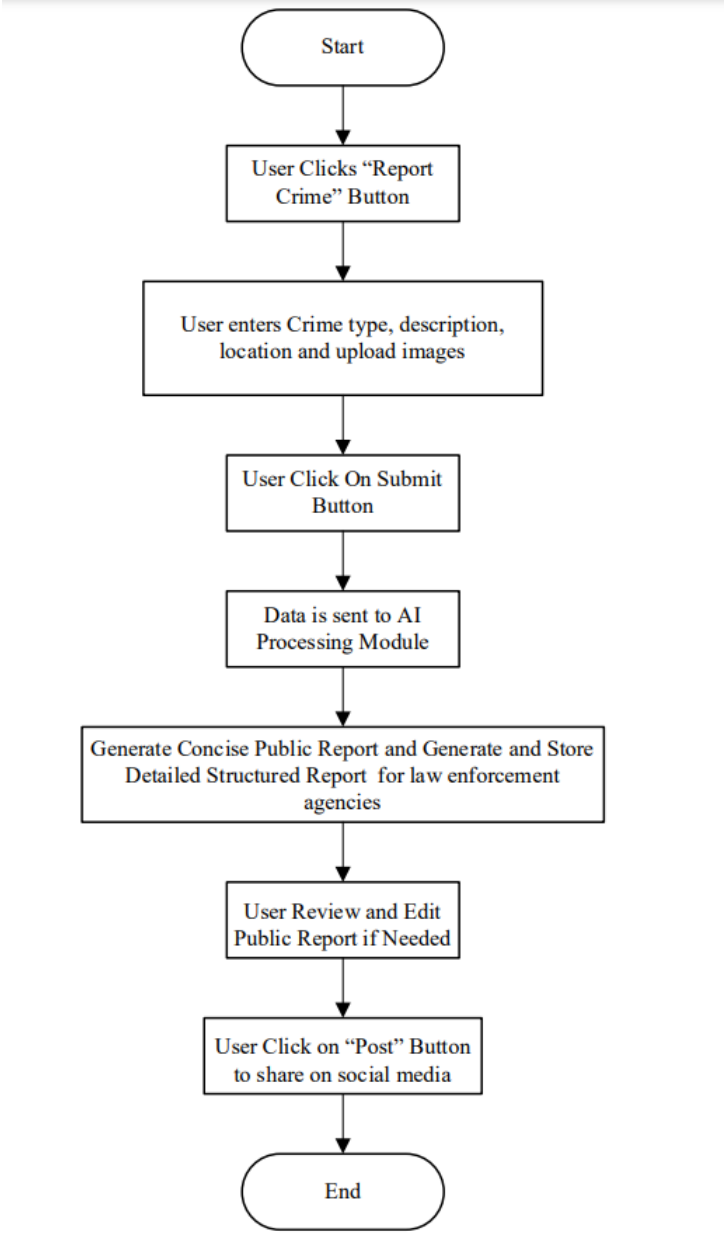


Figure 1: Flow chart of Crime Reporting

5.2. AI Processing

It processes the images and text submitted by a registered user to generate a concise public summary and a detailed, structured report for government authorities.

5.2.1. Flow chart of AI Processing

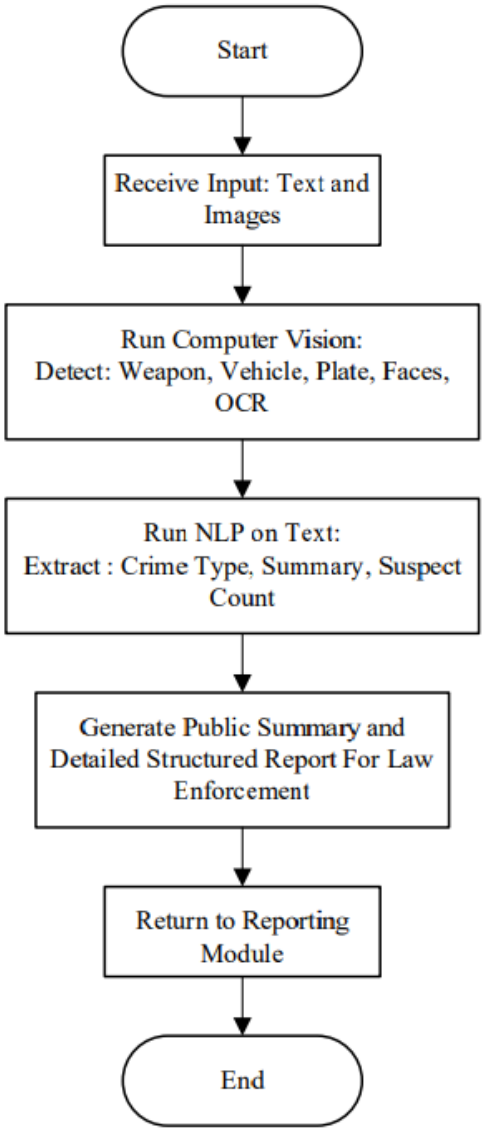


Figure 2: Flow chart of AI Processing

5.3. Missing Person Reporting

It allows registered users to report a missing person by providing detail including name, last seen location, images and other relevant information, which will be shared with government authorities and public feed.

5.3.1. Flow chart of Missing Person Reporting

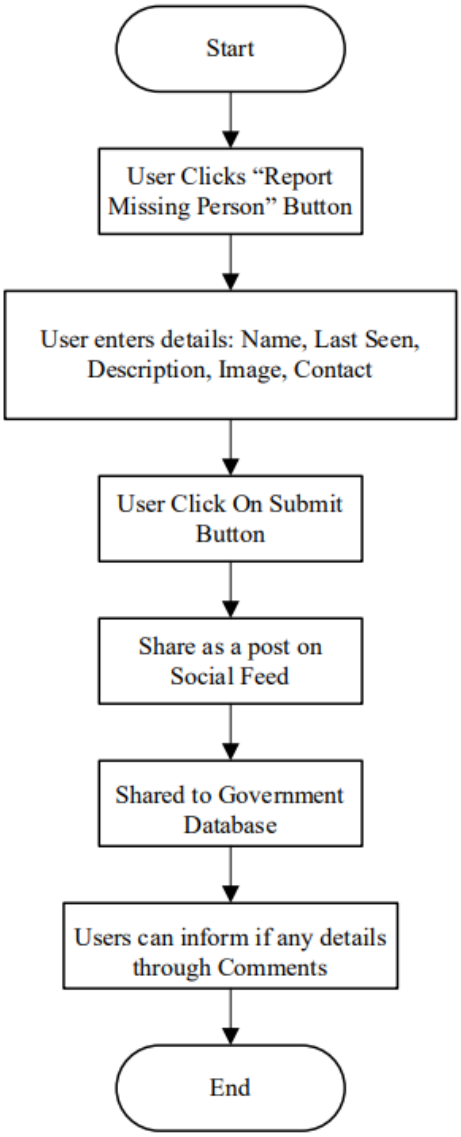


Figure 3: Flow chart of Missing Person Reporting

5.4. Crime Heatmap & Statistics Module

It will use crime data to visualize hotspots on map and generate statistical graphics, allowing registered user to filter data by crime type, time and location.

5.4.1. Flow chart of Crime Heatmap and Statistics Module

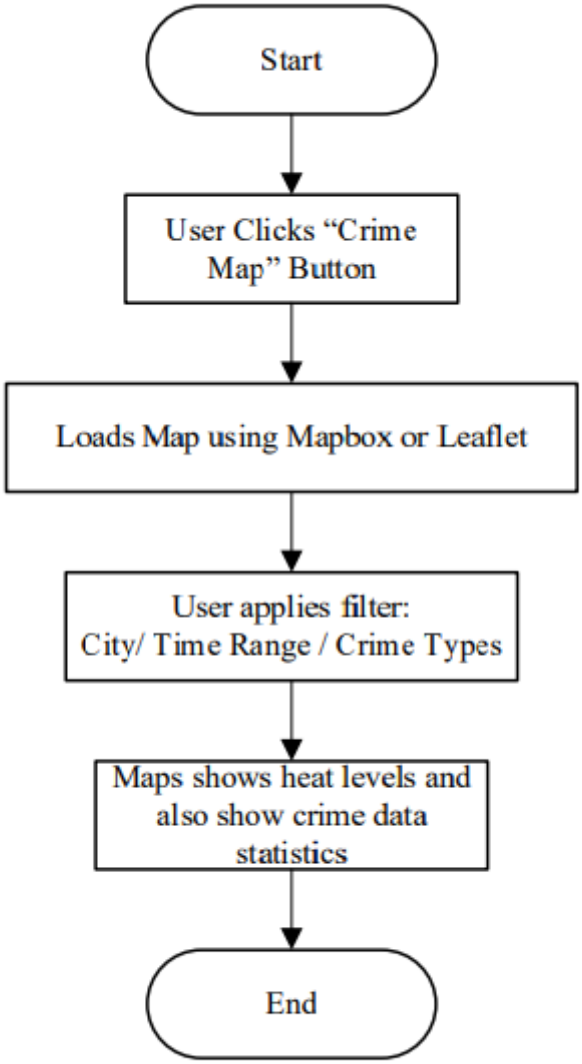


Figure 4: Flow chart of Crime Heatmap and Statistics Module

5.5. Report Management for Law Enforcement Agencies

Law enforcement agencies officials can manage reported incidents and missing persons through dashboard. They can apply filters, view detailed structured ai reports, update statuses of reports to under review, investigated, confirmed or dismissed and automatically notify the reporting user about any status changes.

5.5.1. Flow chart of Report Management for Law Enforcement Agencies

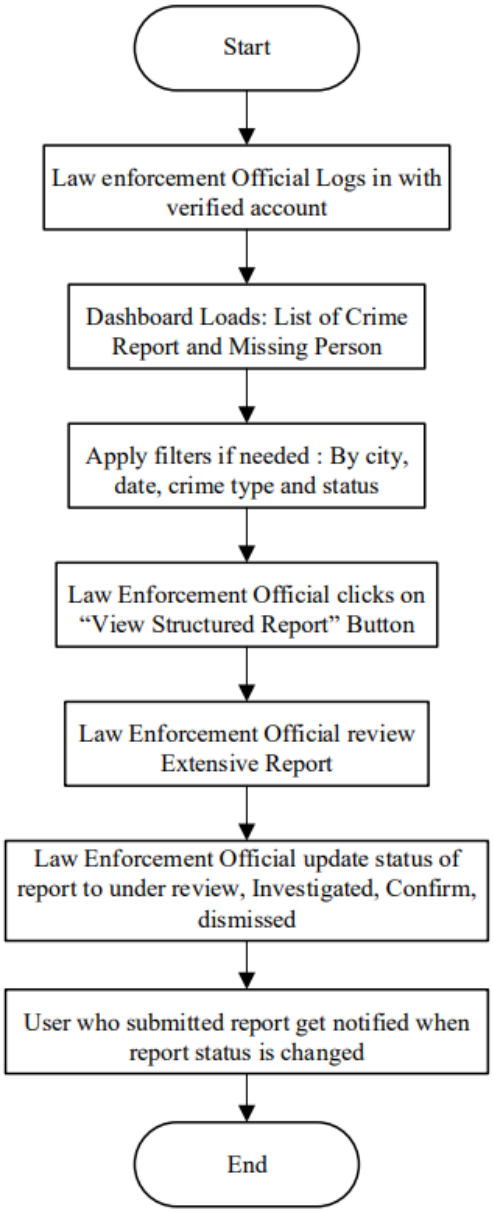


Figure 5: Flow chart of Report Management for Law Enforcement Agencies

5.6. AI Analytics and Suggestions for Law Enforcement Agencies

The law enforcement agencies officials can access AI generated crime analytics, including crime spike chart, pattern recognition and hotspots on map. They AI will also suggest high risk sectors and areas to patrol. The officials can use these insights to plan investigations and deploy patrol units more effectively.

5.6.1. Flow chart of AI Analytics and Suggestions for Law Enforcement Agencies

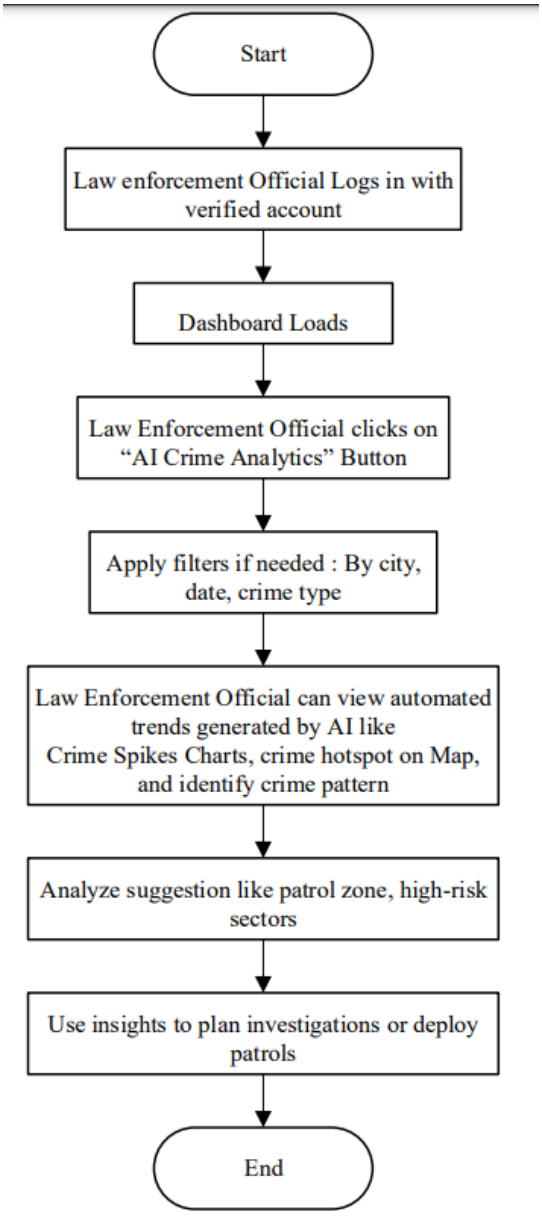


Figure 6: Flow chart of AI Analytics and Suggestions for Law Enforcement Agencies

6. Methodology

The methodology selected for this project is INCREMENTAL MODEL. The project will be built feature by feature, starting with the core structure, followed by gradual addition of each functionality. This approach will allow continuous development with room for improvements and adaptations as the project evolves.

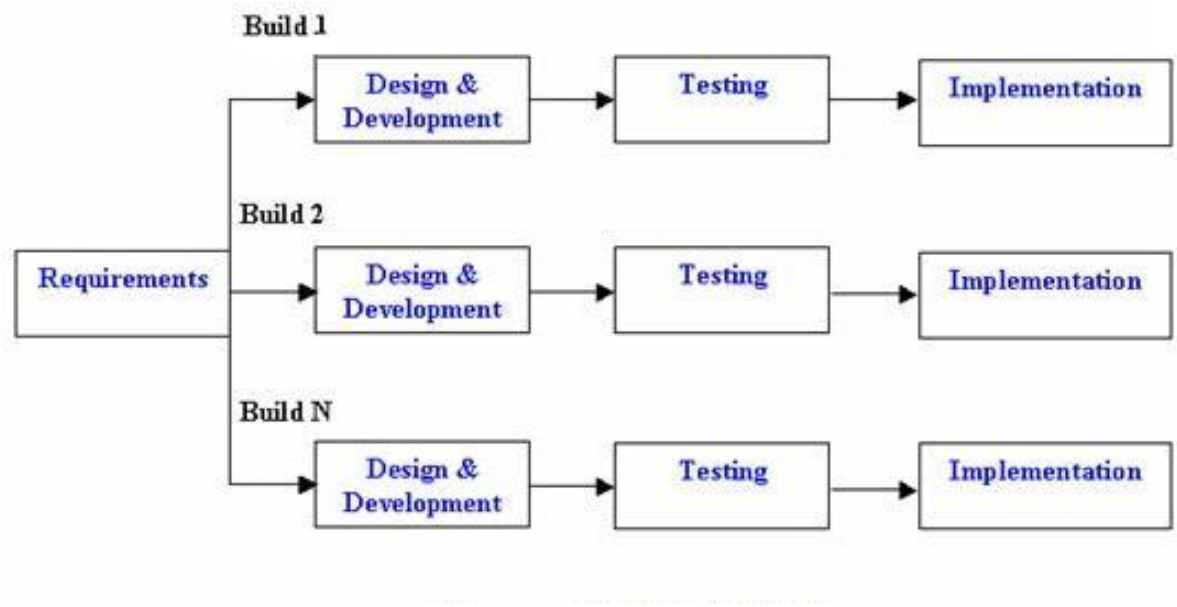


Figure 7: Incremental Model

7. Project Scope

The aim of our project is to develop an AI-powered crime analysis and reporting web platform that bridge the gap between citizen and law enforcement agencies in Pakistan. The system will enable the user to report crime, missing persons and access crime alerts and interactive heat maps. Public users will engage through a social media style feed, while the verified officials will use a structured dashboard enriched with AI insights for smarter crime management.

The proposed system will cover the following scope:

- An interactive crime reporting and public safety platform accessible to citizens
- AI assisted crime report generation and analytics
- Structured dashboard for law enforcement agencies with real time data and trends
- Predictive crime pattern analysis to enhance safety
- Designed specifically for Pakistan's local needs with public and law enforcement collaboration

8. Feasibility Study

Key factors that we considered are technical requirements, ethical handling of user-generated content, potential legal compliances regarding crime data, and social acceptance of AI-based public safety solutions.

8.1. Risks Involved

Table 2: Risks Involved

No.	Key Risks	Hypothetical Statement	Resolution
1.	AI Misinterpretation	AI models may incorrectly interpret crime scene images or text details, leading to misleading reports.	Implement a manual review option for user and allow flagging report by Law Enforcement Agencies.
2.	Data Privacy Concerns	Public users may hesitate to submit reports due to fear of identity exposure or data misuse.	Provide an anonymous posting option and allow users to not share reports on feed.
3.	False or Malicious Reporting	Users could misuse the system to submit fake or harmful crime reports.	Allow flagging by Law Enforcement Agencies.
4.	Server Load & Performance	High number of concurrent users or AI requests could overload the server infrastructure.	Use scalable cloud hosting solutions with dynamic resource allocation (Render, MongoDB Atlas, etc.).

9. Solution Application Areas

The platform is designed for citizens and law enforcement agencies to improve public safety, enhance crime awareness, and enable smarter crime management through AI-driven tools and real-time reporting.

10. Tools and Technology

Following tools and technology will be required in development of the project

10.1. Software

- Visual Studio Code
- Figma
- Git

10.2. Hardware

- Computer with Core i5, 8 GB Ram

10.3. APIs

- Hugging Face
- Roboflow
- Twilio
- Pusher
- JWT (JSON Web Token)

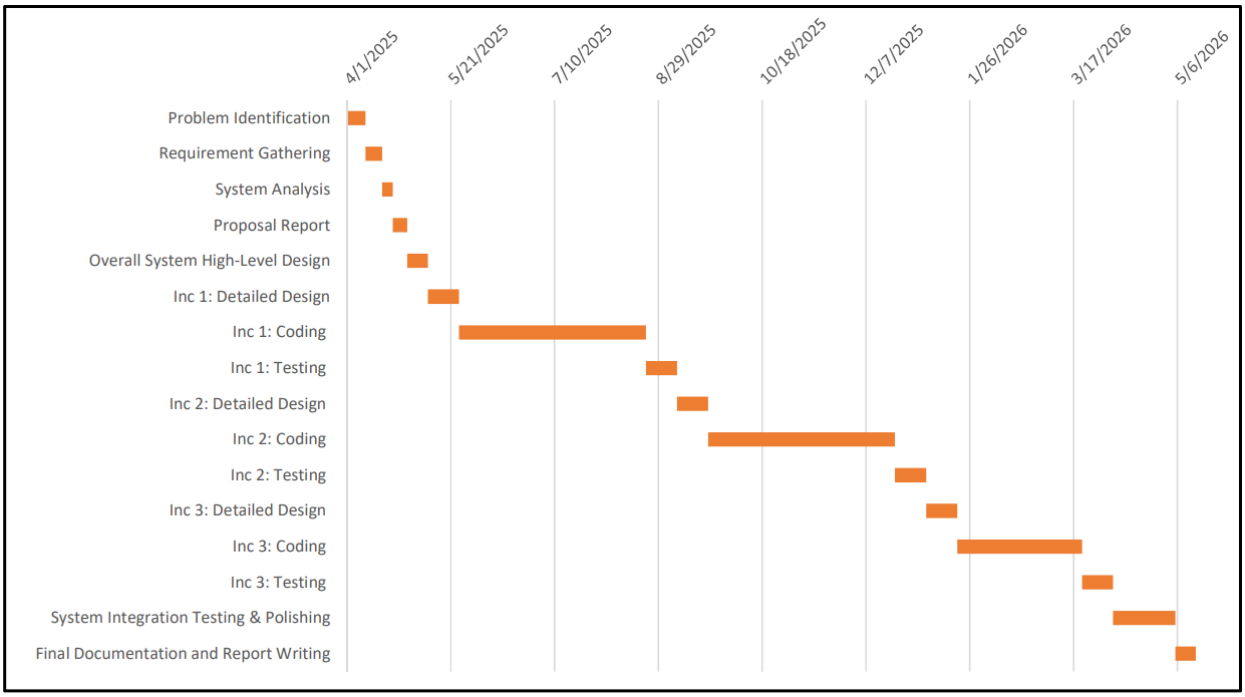
11. Expertise of Team Members

Table 3: Team Expertise

Name	Expertise
Syed Ain Ali Hussnain	Front End Development, UI/UX Design, Python, API Integration
Syed Ali Taqi Hussnain	Full Stack Development, Python, API Integration

12. Milestone

Table 4: Milestone



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