SENTRIX - ENHANCING PUBLIC SAFETY THROUGH CRIME ANALYTICS

A MINI PROJECT REPORT

Submitted by

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(An Autonomous Institution, Affiliated to Anna University, Chennai)

BONAFIDE CERTIFICATE

Certified that this project report **"SENTRIX - ENHANCING PUBLIC SAFETY THROUGH CRIME ANALYTICS "** is the bonafide work of **SARUPRIYA P (211420104441) & REVATHI K (211420104394)** who carried out the project work under my supervision.

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Viva- Voce Examination held on..........................

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<div align="right">

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ABSTRACT

Sentrix is an Android application designed to enhance public safety and crime awareness through technology. The app provides citizens and law enforcement agencies with a platform to report, monitor, and prevent crime in real time. Sentrix integrates features such as crime-prone region mapping using K-Means clustering, automatic crime reporting with location and time auto-filling, and speech navigation for ease of use. It allows users to trigger emergency alarms, share live locations, and upload proof for FIR filing. Additionally, it provides geo-fencing functionality and supports multiple languages, specifically English and Tamil. The system incorporates predictive analytics to identify potential crime hotspots, improving safety alerts and community engagement. The app serves both citizens and police with distinct interfaces to facilitate effective coordination, improve response times, and enhance overall security in local communities.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

1.1 OVERVIEW

In today's world, public safety has become a growing concern, particularly in urban environments. The increase in crime rates, including thefts, assaults, and other unlawful activities, has led to the development of technology-driven solutions aimed at protecting citizens and assisting law enforcement agencies. Among the most vulnerable groups affected by rising crime are women, children, and the elderly, who often face significant safety risks in public spaces. According to reports from the National Crime Records Bureau (NCRB), crimes such as assault and theft occur frequently in areas like bus stations, railway stations, and isolated streets. Ensuring neighborhood safety is now a priority for both individuals and government bodies.

Sentrix is an AI-powered neighborhood safety app designed for citizens and law enforcement. It allows users to report crimes, access real-time data on crime-prone areas, and file FIRs directly. The app auto-fills location details for reports and features an SOS alarm for emergencies, instantly notifying contacts and authorities. Live location sharing enhances safety and response times.

Sentrix goes beyond conventional safety apps by integrating machine learning algorithms to predict and map crime-prone regions using K-Means clustering techniques. This data-driven approach provides users with advanced warnings of potentially unsafe areas, enabling them to avoid risks proactively. The app's real-time crime map assists law enforcement agencies in identifying patterns, prioritizing high-risk zones, and deploying resources efficiently.

Sentrix leverages geo-fencing, speech navigation, and multi-language support to enhance safety. It bridges citizens and police for improved coordination, fostering safer communities. The app empowers users to stay informed and contribute to preventive measures.

1.2 PROBLEM DEFINITION

- **Lack of Awareness About Crime-Prone Areas**: Citizens often do not have access to real-time information on high-risk areas in their neighborhoods, increasing the chances of unknowingly entering dangerous zones.

- **Inefficient Communication with Law Enforcement**: Current systems for crime reporting and emergency coordination are slow, leading to delayed police responses and ineffective communication between citizens and authorities.

- **Limited Use of Predictive Technologies**: Public safety systems do not effectively use AI and machine learning to analyze crime patterns and predict future threats, resulting in reactive rather than proactive crime prevention.

- **Need for a User-Friendly Safety Platform**: There is a demand for a comprehensive app that offers crime reporting, real-time alerts, and location tracking, with a simple interface and support for multiple languages to improve accessibility and safety.

CHAPTER 2

SYSTEM ANALYSIS

2.1 EXISTING SYSTEM

Current public safety systems primarily rely on traditional crime reporting methods like phone hotlines and basic apps. These systems provide limited features such as manual crime reporting, static crime data, and general emergency alerts.

DISADVANTAGES

- **Lack of Real-Time Updates**: Existing systems do not offer live crime alerts, leaving citizens with outdated information.
- **Slow and Inefficient Reporting**: Reporting crimes is manual and time-consuming, often causing delays in police responses.
- **No Predictive Crime Analysis**: The system lacks AI and machine learning capabilities to predict and prevent crime.
- **Weak Communication**: There's insufficient coordination between citizens and law enforcement, hindering effective responses.
- **Poor Accessibility**: Interfaces are often complex, with little support for multiple languages, reducing usability.

2.2 PROPOSED SYSTEM

The proposed Sentrix app aims to enhance public safety and crime reporting through modern technology and user-friendly features.

- **Real-Time Crime Alerts**: Users will receive instant notifications about ongoing crimes or suspicious activities in their area.

- **Streamlined Reporting Process**: The app will allow quick crime reporting with auto-filled location details and the ability to attach proof, improving report accuracy and speed.

- **Predictive Analytics**: AI and machine learning will analyze historical crime data to identify and predict crime-prone areas, helping users avoid risks.

- **Enhanced Communication**: A direct communication channel between citizens and law enforcement will allow users to track report statuses and receive updates.

- **Geo-Fencing**: Users will receive alerts when entering or exiting specific crime-prone areas for proactive safety.

- **Community Engagement**: The app will encourage user feedback and participation in safety initiatives to foster community involvement.

ADVANTAGES

- **Enhanced Safety Awareness**: Provides real-time crime alerts and predictive analytics for informed decision-making.
- **Efficient Crime Reporting**: Streamlined reporting allows quick submission of accurate crime reports for faster police response.
- **Improved Communication**: Establishes direct communication between citizen and law enforcement for timely updates and collaboration.

2.3 DEVELOPMENT ENVIROMENT

SOFTWARE REQUIREMENT

- Android Operating System Version 7.0 OR Higher

- Java Development Kit (JDK) Version 8 OR Higher

- Android Studio IDE Version 4.0 OR Higher

- Programming Languages: Java, XML

- Machine Learning Libraries: TensorFlow or scikit-learn

- Firebase: Real-time database and authentication services

- Google Maps API: For geolocation and mapping features

HARDWARE REQUIREMENT

- Android device with a minimum of 2GB RAM and 16GB internal storage.

- Mobile with Camera and GPS tracker.

CHAPTER 3

SYSTEM DESIGN
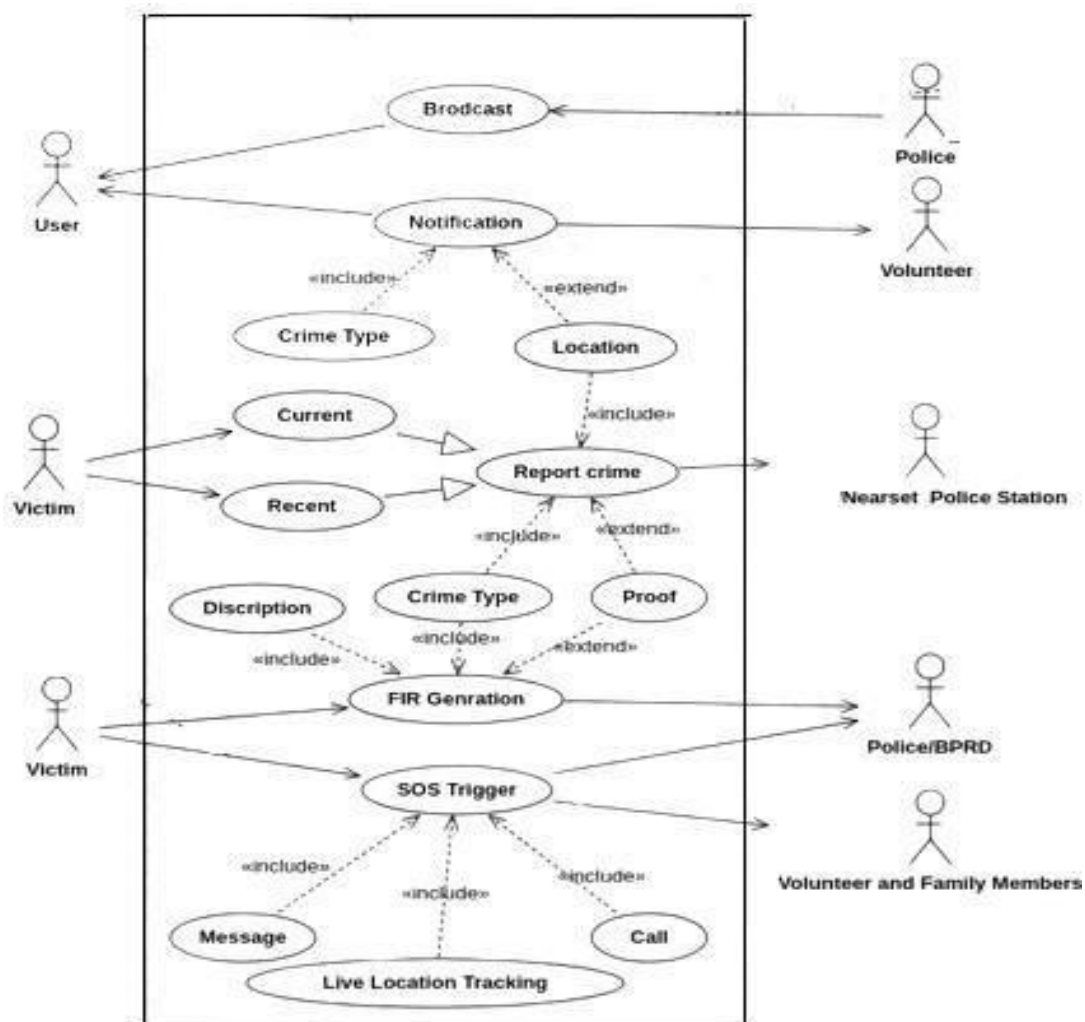
3.1 UML DIAGRAMS

3.1.1 Use case diagram:

Fig 3.1.1 Use case diagram for Sentrix app

This use case diagram refers to activities done by System and users and their corresponding use cases.
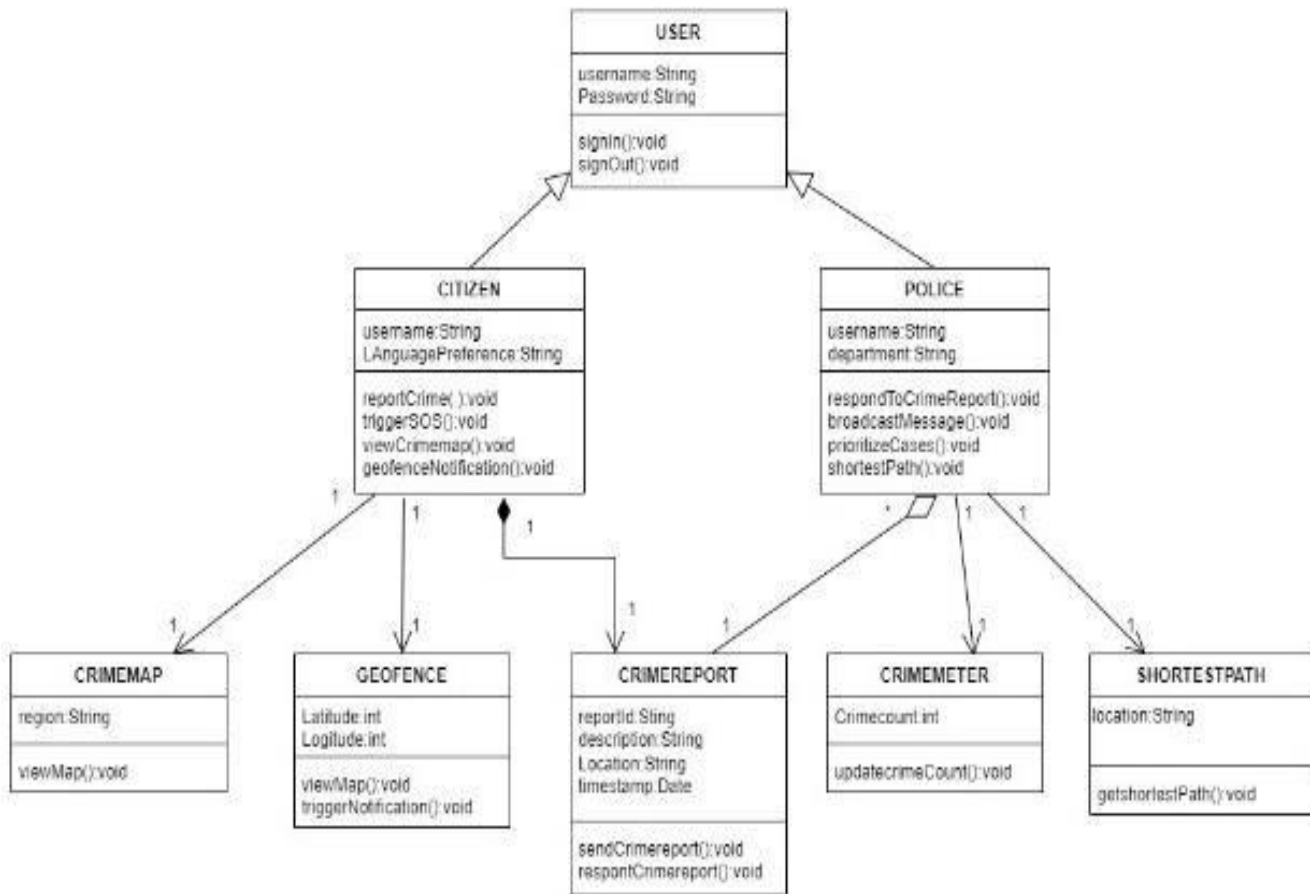
3.1.2 Class diagram:

Fig 3.1.2 Class diagram for Sentrix app

The class diagram refers to relationships between different classes that is citizen, police, crimemap, geofence, crimereport, crimemeter, shortestpath class etc.
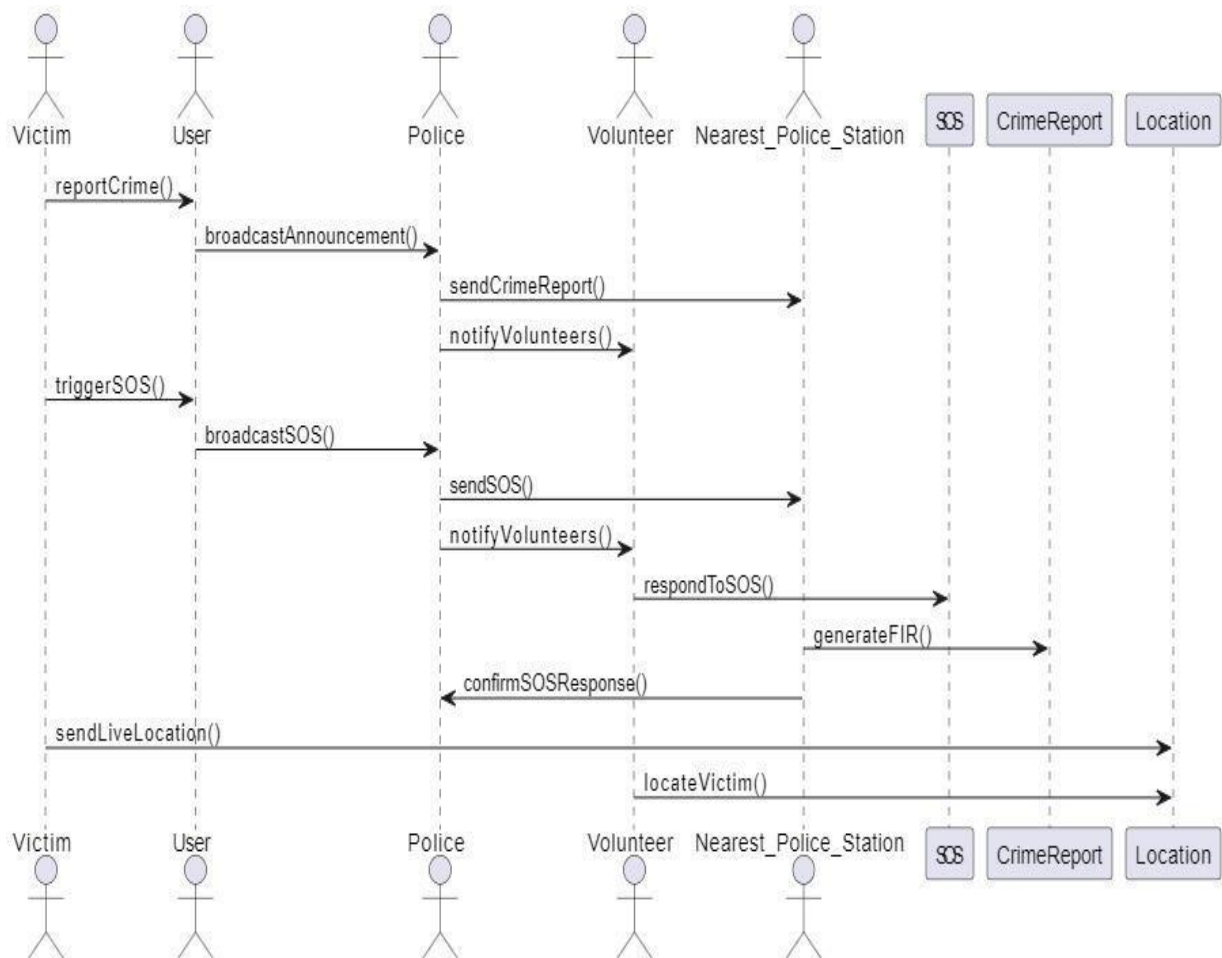
3.1.3 Sequence diagram:

Fig 3.1.3 Sequence diagram for Sentrix app

The sequence diagram of sentrix app shows the sequence of activities performed by the user while using the application.

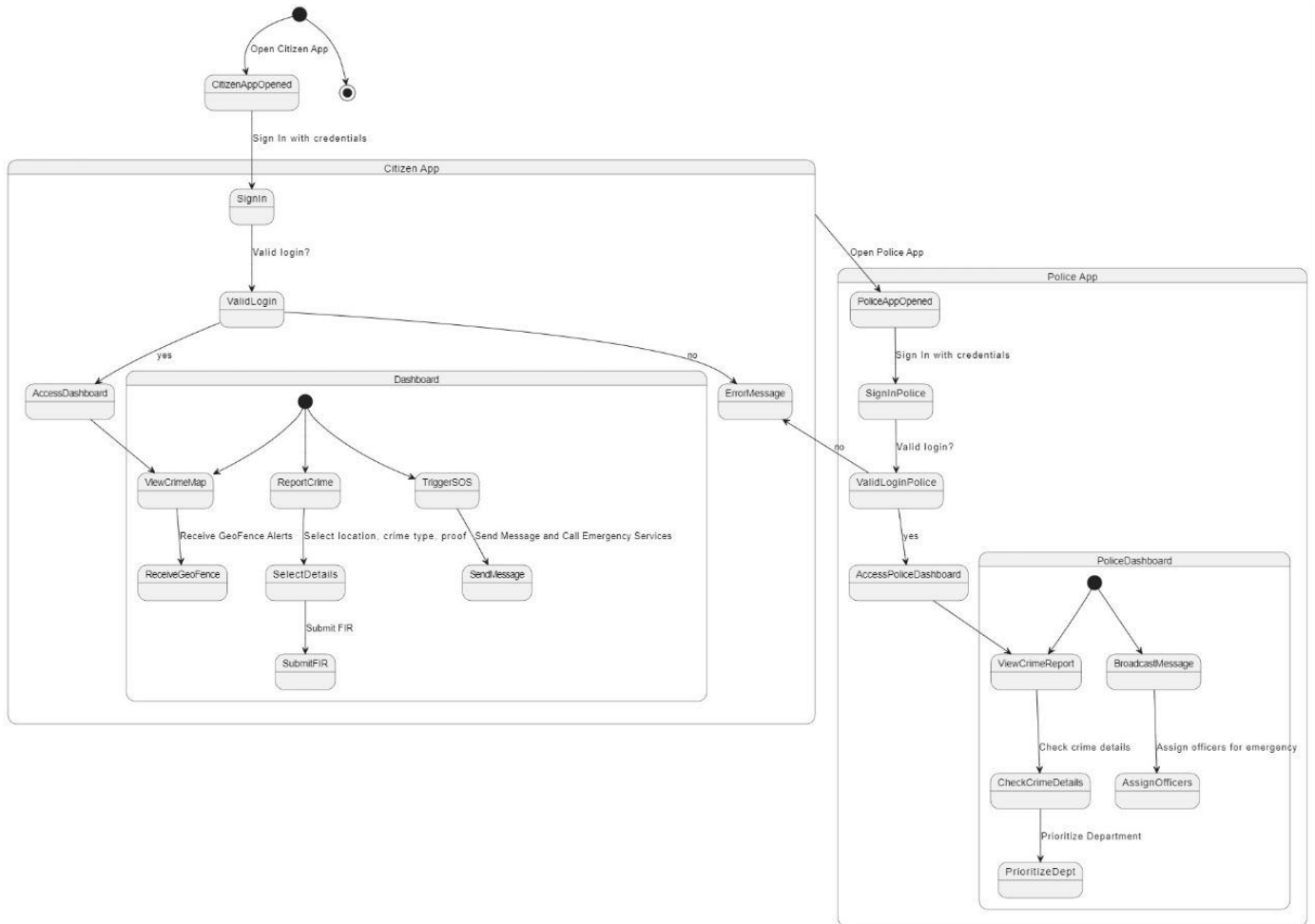# 3.1.4 State chart diagram:

Fig 3.1.4 State chart diagram for Sentix app

The state chart diagram of Sentrix app shows the entire workflow of the application. It shows the various states of the application from the installing stage.

3.1.5 Activity diagram:

Fig 3.1.5 Activity diagram for Sentrix app
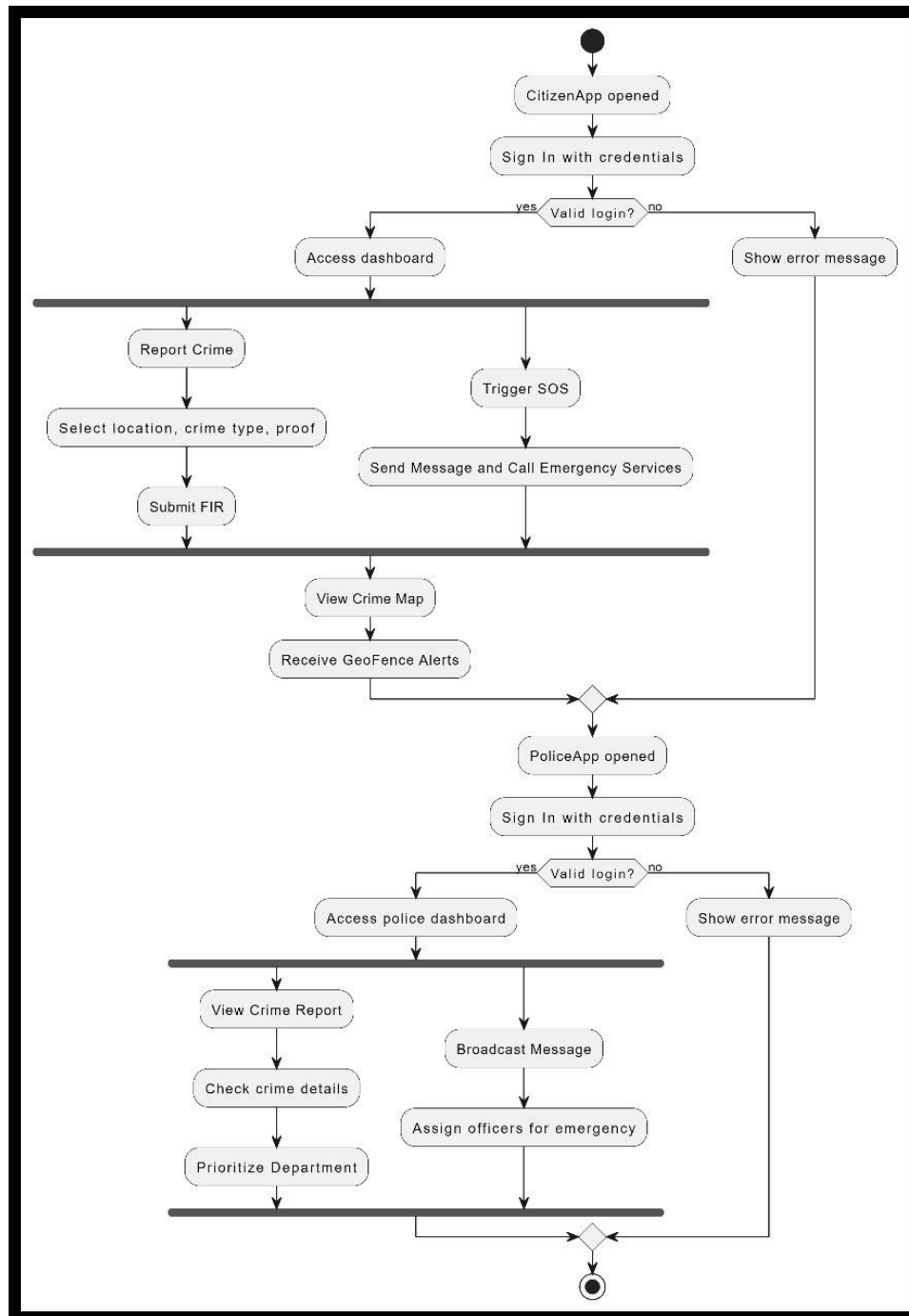
The activity diagram of Sentrix app shows the flow of activities of using the application.
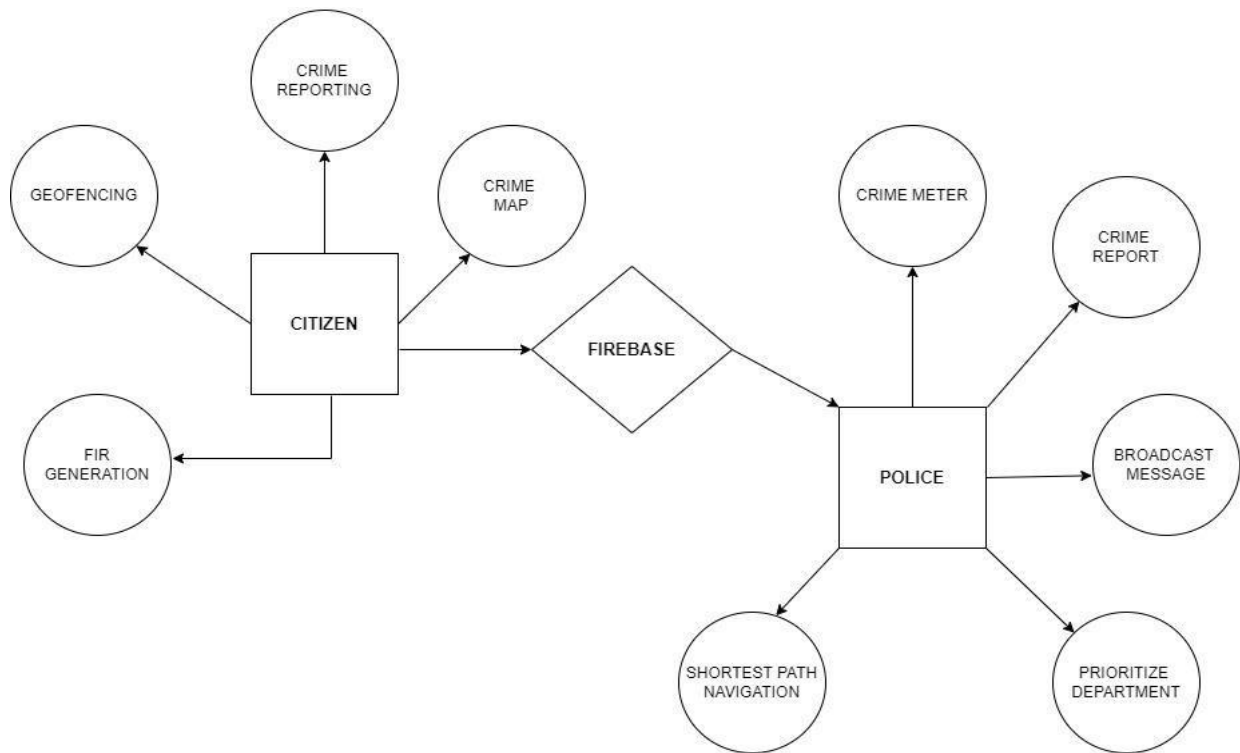
3.2 ER DIAGRAM

Fig 3.2.1 Entity Relationship diagram for Sentrix app

The ER diagram for Sentrix depicts key entities like Crime Mapping, CrimeReporting, and FIR, illustrating user interactions with the system for filing reports, triggering alerts, and handling emergency responses.

3.3 DATAFLOW DIAGRAM

3.3.1 ZERO LEVEL DFD
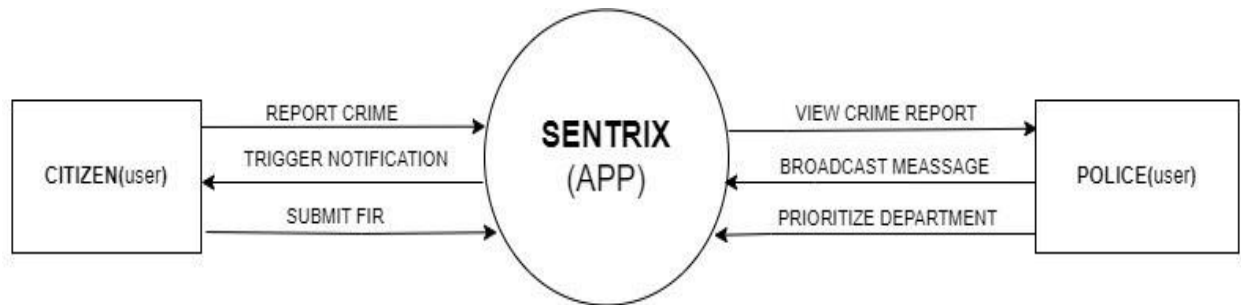
Fig 3.3.1 Data flow diagram level 0

The zero level Data Flow Diagram (DFD) of the Sentrix app provides a high-level overview of the core functionalities and data exchanges within the system. It depicts the interaction between different management levels, showcasing how information flows between users (citizens and police), the central database, and external systems like emergency services. The diagram highlights key processes such as crime reporting, crime-prone zone detection, SOS generation, and real-time communication with law enforcement. This foundational view serves as a blueprint for understanding the overall structure of the app, emphasizing how data is managed, stored, and routed across various entities.

3.3.2 FIRST LEVEL DFD
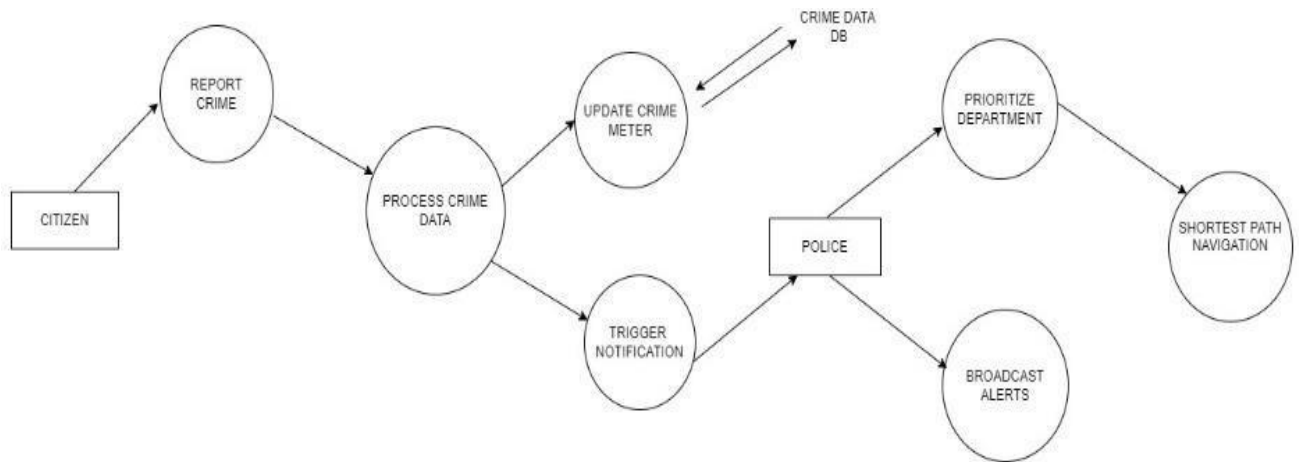
Fig 3.3.2 Dataflow diagram level 1

The first level Data Flow Diagram (DFD) of the Sentrix app provides a detailed representation of the key management levels and their corresponding processes. It breaks down the system into more specific functionalities, such as crime reporting, SOS alerts, crime-prone zone identification, and law enforcement communication. At this level, the interactions between users (citizens and police), the central database, and various external systems are depicted more granularly. This first-level DFD offers a clear view of how the Sentrix app efficiently handles and manages data to ensure timely reporting, effective decision-making, and seamless communication for enhancing public safety.

3.3.3 SECOND LEVEL DFD
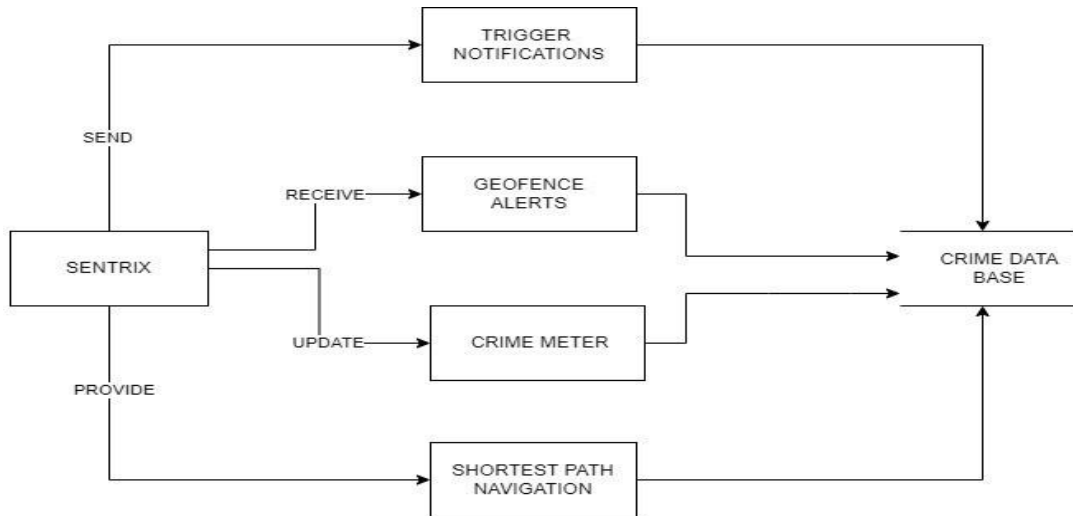
Fig 3.3.3 Dataflow diagram level 2

The second level Data Flow Diagram (DFD) of the Sentrix app delves into the finer details of the system's actions and processes. This level provides a comprehensive view of specific tasks such as how crime reports are processed, how geo-fencing alerts are triggered, and the step-by-step flow of data between users and the system. Each action—like submitting a report, triggering an SOS, or generating crime-prone area alerts—is broken down into its detailed components, showing how inputs from users (both citizens and police) are processed to yield specific outputs. This detailed second-level DFD captures the system's core actions and workflows, ensuring clear visibility into how each feature operates, how data flows between components, and how decisions are made to improve safety and response times within the community.

CHAPTER 4

SYSTEM ARCHITECTURE

4.1 ARCHITECTURE OVERVIEW
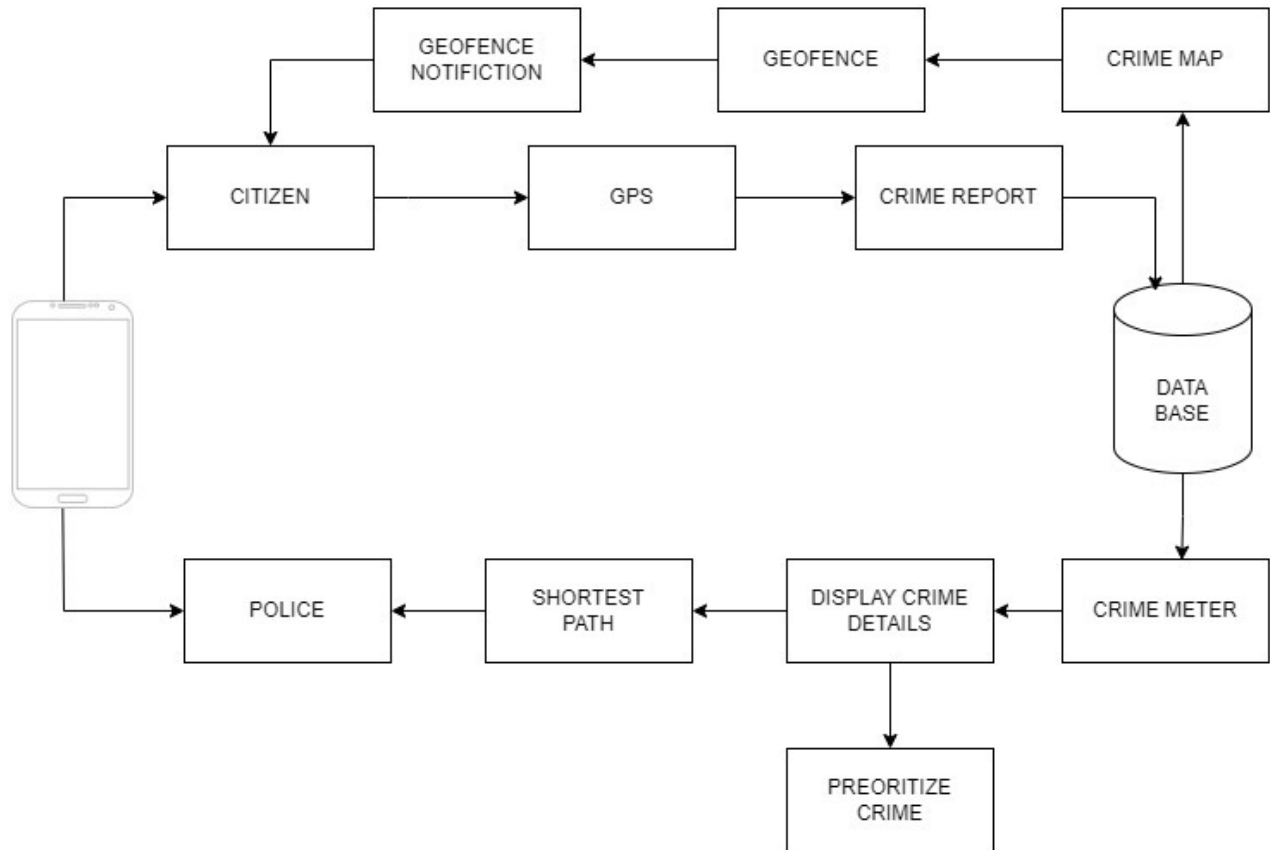
Fig 4.1 Architecture diagram for Sentrix app

Sentrix is an AI-powered neighborhood safety app designed for citizens and law enforcement. It allows users to report crimes, access real-time data on crime-prone areas, and file FIRs directly. The app auto-fills location details for reports and features an SOS alarm for emergencies, instantly notifying contacts and authorities. Live location sharing enhances safety and response times.

4.2 MODULE DESCRIPTION

SENTRIX consists of 6 main modules. They are

- Crime Reporting module.

- Crime Mapping and Analytics module.

- Geo Fencing module.

- Multi Language Support module.

- Prioritize Department module

- Shortest Path Navigation module.

Crime Reporting module:

- Enables users to report crimes in real time.
- Features an intuitive interface for submitting reports.
- Automatically fills in location and time details using GPS.
- Allows users to upload images and videos as evidence to support their reports.
- Includes an emergency alarm activation feature to notify nearby users and authorities instantly.

Crime Mapping and Analytics module :

- Utilizes K-Means clustering and predictive analytics to map crime-prone regions on Google Maps.
- Analyzes historical crime data to identify potential hotspots.
- Assists law enforcement in optimizing patrols and resource allocation.
- Allows citizens to view high-risk areas, enhancing their situational awareness and safety.

Geofencing module :

- Implements geo-fencing technology to define virtual boundaries in specific areas.
- Sends alerts to users when entering or exiting these zones.
- Enhances community safety by notifying users of potential threats nearby.

Multi Language Support module :

- Ensures app accessibility to a diverse user base by offering multi-language support.
- Specifically supports English and Tamil languages.
- Includes language preferences in user settings for personalized interaction.
- Enhances usability and inclusivity by allowing users to engage with the app in their preferred language.

Prioritize Department module:

- Optimizes resource management and departmental prioritization using real-time data insights.
- Identifies high-priority areas requiring immediate intervention through analysis of crime patterns and community feedback.
- Facilitates effective allocation of personnel, equipment, and patrol resources for swift response to threats.
- Enhances strategic planning with data-driven recommendations, ultimately improving public safety and community trust.

Shortest Path Navigation module:

- Provides optimized real-time routing for law enforcement personnel to incidents and emergencies.
- Utilizes GPS technology to calculate the fastest routes based on current traffic conditions and road closures.
- Allows route customization, enabling officers to avoid high-crime areas when necessary.

CHAPTER 5

SYSTEM IMPLEMENTATION

5.1 CITIZEN APP :

ANDROIDMANIFEST.XML

```xml
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools">
<uses-permission android:name="android.permission.ACCESS_FINE_LOCATION" />
<uses-feature
        android:name="android.hardware.sensor.accelerometer"
        android:required="true" />
<uses-permission android:name="android.permission.ACCESS_COARSE_LOCATION"
/>
<uses-permission android:name="android.permission.ACCESS_NETWORK_STATE" />
<uses-permission android:name="android.permission.CALL_PHONE" />

    <uses-permission android:name="android.permission.INTERNET" />
    <uses-permission android:name="android.permission.POST_NOTIFICATIONS" />
    <uses-permission android:name="android.permission.VIBRATE" />

    <uses-permission
    android:name="android.permission.READ_EXTERNAL_STORAGE" />

    <uses-permission
    android:name="android.permission.WRITE_EXTERNAL_STORAGE" />
        <uses-permission android:name="android.permission.FOREGROUND_SERVICE"
    />
        <uses-permission android:name="android.permission.CAMERA" />
    <uses-permission
    android:name="android.permission.ACCESS_BACKGROUND_LOCATION" />
    <uses-permission android:name="android.permission.ACCESS_NETWORK_STATE
    "/>
```

```xml
<uses-permission
android:name="android.permission.CHANGE_NETWORK_STATE"/>
    <uses-permission android:name="android.permission.INTERNET"/>
    <uses-permission android:name="android.permission.ACCESS_WIFI_STATE"/>
    <uses-permission android:name="android.permission.CHANGE_WIFI_STATE"/
<application
        android:allowBackup="true"
        android:icon="@drawable/logo"
        android:label="@string/app_name"
        android:roundIcon="@drawable/logo"
        android:supportsRtl="true"
        android:theme="@style/AppTheme"
        tools:ignore="GoogleAppIndexingWarning">

        <activity android:name=".Crime_current_2"/>
        <activity android:name=".CheckWifi"/>


        <meta-data
            android:name="com.google.android.geo.API_KEY"
            android:value="@string/google_maps_key" />

        <activity
            android:name=".GeoFence"
            android:label="@string/title_activity_geo_fire"

         />
        <receiver android:name=".GeofenceBroadcastReceiver" />

        <activity android:name=".Settings" />
        <activity android:name=".PolygonMap"
            android:label="PolyMap"/>
        <activity
            android:name=".StressTracerMap"
            android:launchMode="singleTask"
            android:screenOrientation="fullSensor"
            android:taskAffinity="" />
        <activity
            android:name=".Current_crime_3"
            android:screenOrientation="fullSensor" />
```

```xml
<activity
    android:name=".BroadcastMessage"
    android:screenOrientation="fullSensor" />
<activity
    android:name=".Sign_up"
    android:screenOrientation="fullSensor" />
<activity
    android:name=".Choose_user_type"
    android:screenOrientation="fullSensor" />
<activity
    android:name=".SignIn"
    android:screenOrientation="fullSensor" />
<activity
    android:name=".LaterActivity"
    android:screenOrientation="fullSensor" />
<activity
    android:name=".Later_2"
    android:screenOrientation="fullSensor" />
<activity
    android:name=".Later_3"
    android:screenOrientation="fullSensor" />
<activity
    android:name=".Fir_token"
    android:screenOrientation="fullSensor" />
<activity
    android:name=".ReportFIR"
    android:screenOrientation="fullSensor" />
<activity
    android:name=".Report_Crime"
    android:label="@string/title_activity_report___crime"
    android:screenOrientation="fullSensor" />
<activity
    android:name=".CurrentCrime"
    android:screenOrientation="fullSensor" />
<activity
    android:name=".GeoFire"
    android:label="@string/title_activity_geo_fire"
    android:screenOrientation="fullSensor" />
<activity
    android:name=".Onboard"
```

```xml
            android:screenOrientation="fullSensor" />
        <activity
            android:name=".Splash_w"
            android:exported="true"
            android:screenOrientation="fullSensor">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>

        </activity>

        <provider
            android:name="androidx.core.content.FileProvider"
            android:authorities="com.example.safetapp.fileprovider"
            android:exported="false"
            android:grantUriPermissions="true">
            <meta-data
                android:name="android.support.FILE_PROVIDER_PATHS"
                android:resource="@xml/file_paths" />
        </provider>
        <activity android:name=".livePoliceLocationAndNearbyPlaces"/>
        <service android:name=".BackgroundWorker" />
    </application>

</manifest>
```

GEOFENCE.JAVA:

```java
package com.example.safetapp;

import android.app.PendingIntent;
import android.content.Context;
import android.content.ContextWrapper;
import android.content.Intent;

import com.google.android.gms.common.api.ApiException;
import com.google.android.gms.location.Geofence;
import com.google.android.gms.location.GeofenceStatusCodes;
import com.google.android.gms.location.GeofencingRequest;
import com.google.android.gms.maps.model.LatLng;

public class GeofenceHelper extends ContextWrapper {

    private static final String TAG = "GeofenceHelper";
    PendingIntent pendingIntent;

    public GeofenceHelper(Context base) {
        super(base);
    }

    public GeofencingRequest getGeofencingRequest(Geofence geofence) {
        return new GeofencingRequest.Builder()
                .addGeofence(geofence)
                .setInitialTrigger(GeofencingRequest.INITIAL_TRIGGER_ENTER)
                .build();
    }

    public Geofence getGeofence(String ID, LatLng latLng, float radius,
    int transitionTypes)
    {
        return new Geofence.Builder()
                .setCircularRegion(latLng.latitude, latLng.longitude, radius)
                .setRequestId(ID)
                .setTransitionTypes(transitionTypes)
                .setLoiteringDelay(5000)
```

```java
                .setExpirationDuration(Geofence.NEVER_EXPIRE)
                .build();
    }

    public PendingIntent getPendingIntent()
{
        if (pendingIntent != null)
{

            return pendingIntent;
        }
        Intent intent = new Intent(this, GeofenceBroadcastReceiver.class);
        pendingIntent = PendingIntent.getBroadcast(this, 2607,
        intent,  PendingIntent.FLAG_UPDATE_CURRENT);

        return pendingIntent;
    }

    public String getErrorString(Exception e)
{
        if (e instanceof ApiException)
{

            ApiException apiException = (ApiException) e;
            switch (apiException.getStatusCode())
{

                case GeofenceStatusCodes
                        .GEOFENCE_NOT_AVAILABLE:
                    return "GEOFENCE_NOT_AVAILABLE";
                case GeofenceStatusCodes
                        .GEOFENCE_TOO_MANY_GEOFENCES:
                    return "GEOFENCE_TOO_MANY_GEOFENCES";
                case GeofenceStatusCodes
                        .GEOFENCE_TOO_MANY_PENDING_INTENTS:
                    return "GEOFENCE_TOO_MANY_PENDING_INTENTS";
            }
        }
        return e.getLocalizedMessage();
}
}
```

ACTIVITY_GEOFENCE.XML

```xml
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    xmlns:tools="http://schemas.android.com/tools"
    tools:context=".GeoFence">

    <fragment
        android:id="@+id/map"
        android:name="com.google.android.gms.maps.SupportMapFragment"
        android:layout_width="match_parent"
        android:layout_height="match_parent" />

    <com.google.android.material.bottomnavigation.BottomNavigationView
        android:id="@+id/bottom_nav"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_alignParentBottom="true"
        app:itemBackground="@color/colorPrimary"
        app:itemIconTint="@drawable/select_item"
        app:itemTextColor="@drawable/select_item"
        app:menu="@menu/activity_home_drawer" />

</RelativeLayout>
```

5.2 POLICE APP:

ANDROIDMANIFEST.XML

```xml
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
 xmlns:tools="http://schemas.android.com/tools"
 package="com.example.policeapp">
 <!--
    The ACCESS_COARSE/FINE_LOCATION permissions are not required to use
    Google Maps Android API v2, but you must specify either coarse or fine
    location permissions for the 'MyLocation' functionality.
 -->
<uses-permission android:name="android.permission.ACCESS_FINE_LOCATION"/>

 <uses-permission ="android.permission.ACCESS_COARSE_LOCATION" />
 <uses-permission android:name="android.permission.INTERNET" />

 <meta-data
    android:name="com.google.android.geo.API_KEY"
    android:value="@string/google_maps_key" />

 <application
    android:allowBackup="true"
    tools:replace="android:allowBackup"
    android:icon="@mipmap/ic_launcher"
    android:label="@string/app_name"
    android:roundIcon="@mipmap/ic_launcher_round"
    android:supportsRtl="true"
    android:theme="@style/AppTheme">
    <activity android:name=".Priority"
       android:screenOrientation="fullSensor" />

    <activity android:name=".Reports"
       android:screenOrientation="fullSensor"/>

    <meta-data
       android:name="com.google.android.geo.API_KEY"
```

```xml
    <activity
        android:name=".PlotCrime"
        android:label="@string/title_activity_plot_crime" />
    <activity
        android:name=".Home"
        android:screenOrientation="fullSensor" />
    <activity
        android:name=".SignIn"
        android:screenOrientation="fullSensor" />
    <activity
        android:name=".MainActivity"
        android:exported="true"
        android:screenOrientation="fullSensor">
        <intent-filter>
            <action android:name="android.intent.action.MAIN" />
            <category android:name="android.intent.category.LAUNCHER" />
        </intent-filter>
    </activity>
  </application>

</manifest>
```

PRIORITY.JAVA

package com.example.policeapp;

import androidx.appcompat.app.AppCompatActivity;

import android.app.Dialog;
import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.AdapterView;
import android.widget.ArrayAdapter;
import android.widget.Button;
import android.widget.EditText;
import android.widget.RatingBar;
import android.widget.Spinner;
import android.widget.Toast;

public class Priority extends AppCompatActivity implements
AdapterView.OnItemSelectedListener {

   Spinner spinner;

   String[] departments = {

      "Select Department", "RTO", "Fire Station", "Hospital", "Cyber Crime"
   };

   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.*activity_priority*);
      spinner = findViewById(R.id.*dept_spinner*);
      spinner.setOnItemSelectedListener(this);
      ArrayAdapter<String> ad = new ArrayAdapter<>(
         this,
         android.R.layout.*simple_spinner_item*,
         departments);

```java
        ad.setDropDownViewResource(
            android.R.layout
                .simple_spinner_dropdown_item);

        spinner.setAdapter(ad);
    }

    @Override
    public void onItemSelected(AdapterView<?> adapterView, View view, int i, long l)
{

        Toast.makeText(this, "Selected: " + departments[i],
Toast.LENGTH_SHORT).show();
    }

    @Override
    public void onNothingSelected(AdapterView<?> adapterView) {

    }
    @Override
    public void onBackPressed() {
        final Dialog dialog = new Dialog(Priority.this);
        dialog.setContentView(R.layout.custom_dialog);
        Button dialogButton = dialog.findViewById(R.id.btn_submit);
        final EditText Review = dialog.findViewById(R.id.review);
        final RatingBar ratingBar = dialog.findViewById(R.id.rating_bar);
        dialogButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String rating = String.valueOf(ratingBar.getRating());
                String review = Review.getText().toString();
                Intent intent= new Intent(Priority.this, Home.class);
                startActivity(intent);
                dialog.dismiss();
            }
        });
        dialog.show();}}
```

ACTIVITY_PRIORITY.XML

```xml
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:tools="http://schemas.android.com/tools"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  tools:context=".Priority">

  <TextView
    android:id="@+id/crime_type"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:padding="10dp"
    android:text="CHAIN SNATCHING"
    android:textAlignment="center"
    android:textAllCaps="true"
    android:textColor="@color/white"
    android:textSize="22sp"
    android:textStyle="normal"
    android:background="@color/red" />

  <LinearLayout
    android:id="@+id/layout_1"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_below="@+id/crime_type"
    android:orientation="horizontal">

   <TextView
      android:id="@+id/time"
      android:layout_width="0dp"
      android:layout_height="wrap_content"
      android:layout_marginStart="10dp"
      android:layout_marginTop="20dp"
      android:layout_marginEnd="16dp"
      android:layout_weight="1"
```

```xml
            android:textAlignment="center"
            android:textAllCaps="true"
            android:textColor="@color/grey"
            android:textSize="18sp"
            android:textStyle="normal"
            android:text="@string/_12_45" />
</LinearLayout>

<TextView
    android:id="@+id/text_priority"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_below="@+id/layout_1"
    android:layout_marginStart="16dp"
    android:layout_marginTop="20dp"
    android:text="@string/priority"
    android:textStyle="normal" />

<RadioGroup
    android:id="@+id/priority_grp"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_below="@+id/text_priority"
    android:layout_centerHorizontal="true"
    android:layout_marginStart="16dp"
    android:layout_marginTop="10dp"
    android:layout_marginEnd="16dp"
    android:orientation="horizontal">

    <RadioButton
        android:id="@+id/p_1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        android:text="@string/p1" />
  <RadioButton android:id="@+id/p_2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
```

```xml
            android:layout_weight="1"
            android:text="@string/p2" />

        <RadioButton
            android:id="@+id/p_3"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:text="@string/p3" />

        <RadioButton
            android:id="@+id/p_4"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:text="@string/p4" />
    </RadioGroup>

    <TextView
        android:id="@+id/text_dept"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_below="@+id/priority_grp"
        android:layout_marginStart="16dp"
        android:layout_marginTop="20dp"
        android:textAllCaps="true"
        android:textSize="20sp"
        android:textStyle="normal" />

    <Spinner
        android:id="@+id/dept_spinner"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_below="@+id/text_dept"
        android:layout_marginStart="16dp"
        android:layout_marginTop="10dp"
        android:layout_marginEnd="16dp" />
</RelativeLayout>
```

CHAPTER 6

SYSTEM TESTING

6.1 TEST CASES & REPORTS

TEST CASE ID	TESTCASE/ ACTION TO BE PERFORMED	EXPECTED RESULT	ACTUAL RESULT	PASS/ FAIL
1	Selecting the 'Report Crime' button.	Navigates to the crime reporting interface	Navigates to the crime reporting interface	Pass
2	Filling out the crime report form and submitting	Displays a confirmation message for successful report	Displays a confirmation message for successful report	Pass
3	Viewing the map of crime-prone areas	Displays a map highlighting crime hotspots	Displays a map highlighting crime hotspots	Pass
4	Clicking on a crime hotspot on the map	Shows details of incidents in that area	Shows details of incidents in that area	Pass
5	Activating the emergency alarm	Sends alerts to nearby users and authorities	Sends alerts to nearby users and authorities	Pass
6	Accessing the 'Incident Tracking' feature	Displays the status of reported incidents	Displays the status of reported incidents	Pass

TEST CASE ID	TESTCASE/ ACTION TO BE PERFORMED	EXPECTED RESULT	ACTUAL RESULT	PASS/ FAIL
7	Selecting the 'View Alerts' option	Shows recent alerts related to local crime incidents	Shows recent alerts related to local crime incidents	Pass
8	Speech Navigation	App correctly interprets the voice command and performs the requested action	App correctly interprets the voice command and performs the requested action	Pass
9	Selecting the 'Multi-Language Support' option	Allows user to select preferred language	Allows user to select preferred language	Pass
10	Activating the Geo-Fencing feature	Configures and displays alerts for designated zones	Configures and displays alerts for designated zones	Pass
11	Clicking on 'Emergency Contacts'	Displays a list of saved emergency contacts	Displays a list of saved emergency contacts	Pass
12	Triggering SOS in Emergency	Sends an alert to emergency contacts with location info	Sends an alert to emergency contacts with location info	Pass

CHAPTER 7

7.1 CONCLUSION

Sentrix serves as a key technological solution to enhance public safety and crime awareness. By enabling seamless real-time crime reporting and monitoring, it strengthens the collaboration between citizens and law enforcement agencies. Key features like crime-prone region mapping, automatic crime reporting, and predictive analytics provide timely and effective responses to potential threats. With support for multiple languages, including English and Tamil, Sentrix ensures accessibility across diverse user groups. The app contributes significantly to improving security, reducing crime, and fostering stronger relationships between the public and law enforcement. Continuous improvements and feedback will be integral to its future development and effectiveness.

7.2 FUTURE ENHANCEMENTS

1. Integrating the app with local emergency services such as fire departments, medical aid, and disaster response teams, providing users with a one-stop platform for reporting various emergencies and receiving immediate assistance

2. Implement AR-based features where users can view crime-prone areas or safety zones overlaid onto their camera feed, enhancing situational awareness when navigating unfamiliar areas.

3. Introduce a feature that generates safe walking or driving routes for users based on current crime data and known unsafe areas. The app could reroute users in real-time if a crime is reported near their location.

The above mentioned are the future enhancements that can be done to make this project much more dynamic.
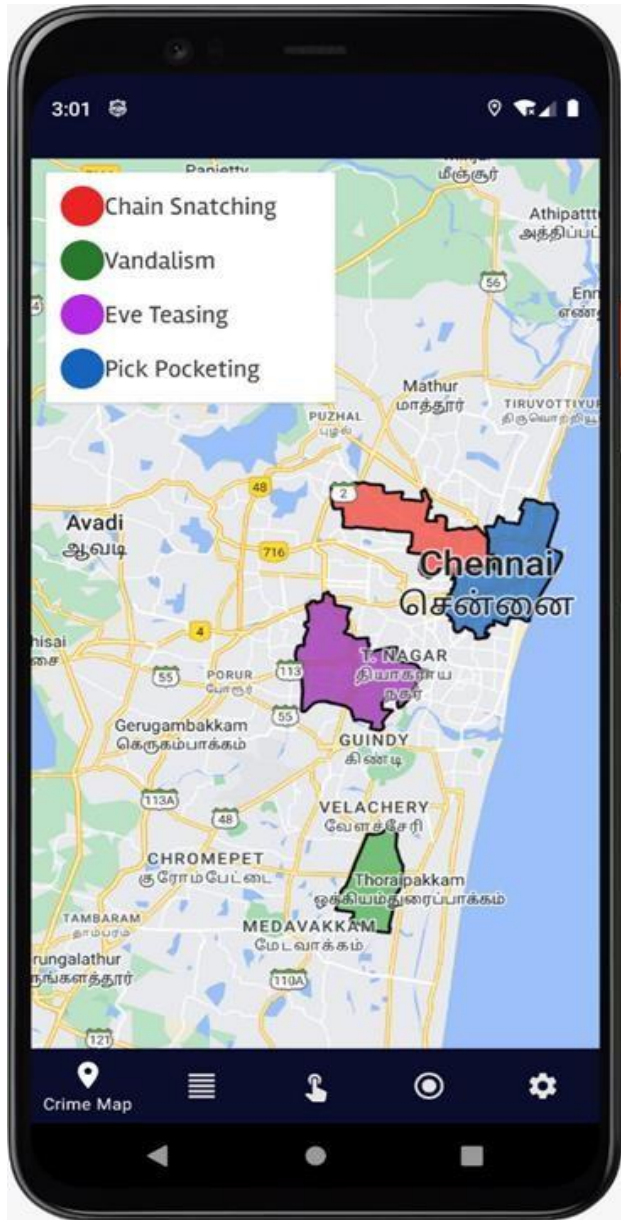
CHAPTER 8
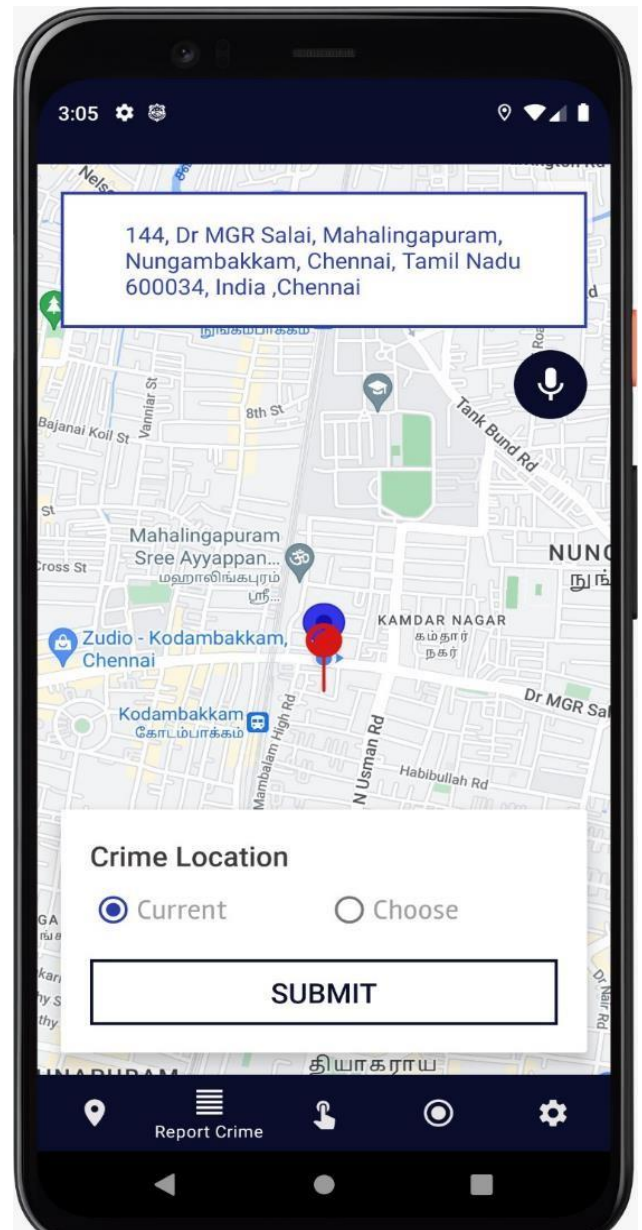## APPENDICES

SAMPLE SCREENSHOTS

Fig 8.1 Crime Prone Map

Fig 8.2 Report Crime

Fig 8.3 Reported Details
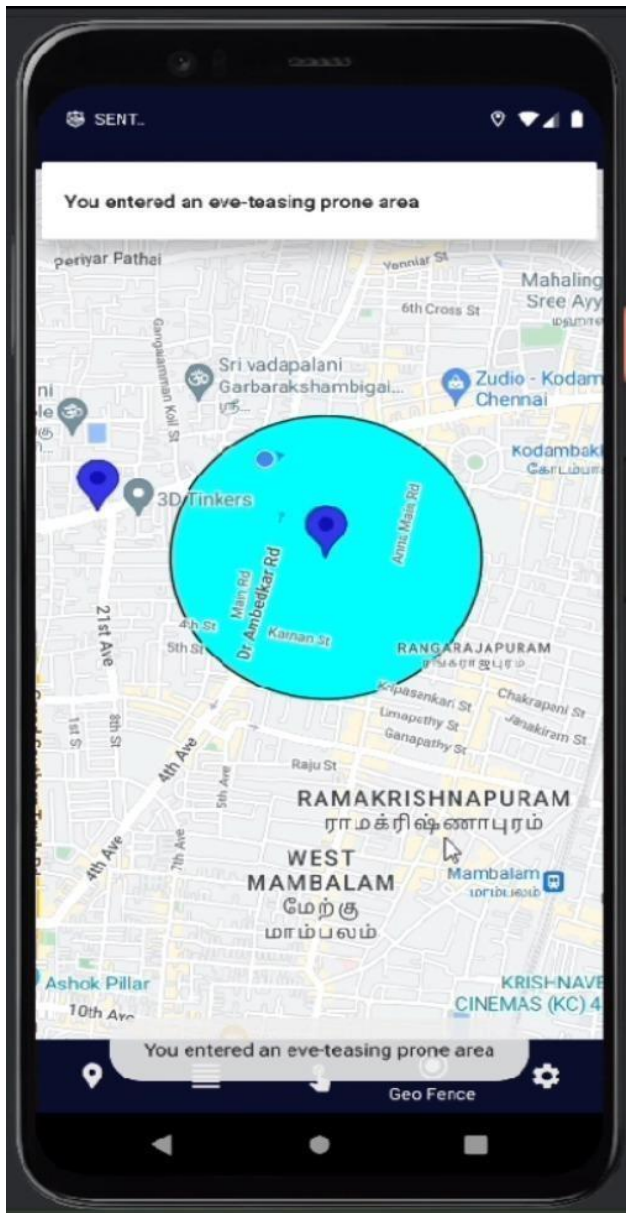

Fig 8.4 Crime Details
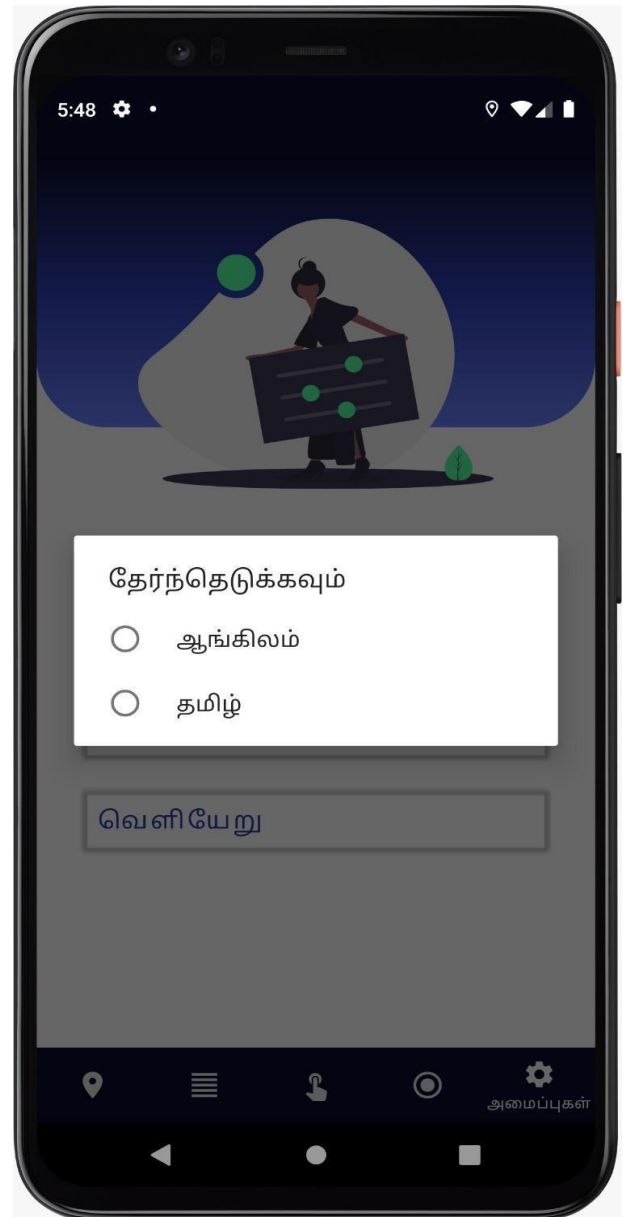
Fig 8.5 Geofencing Feature

Fig 8.6App Localization
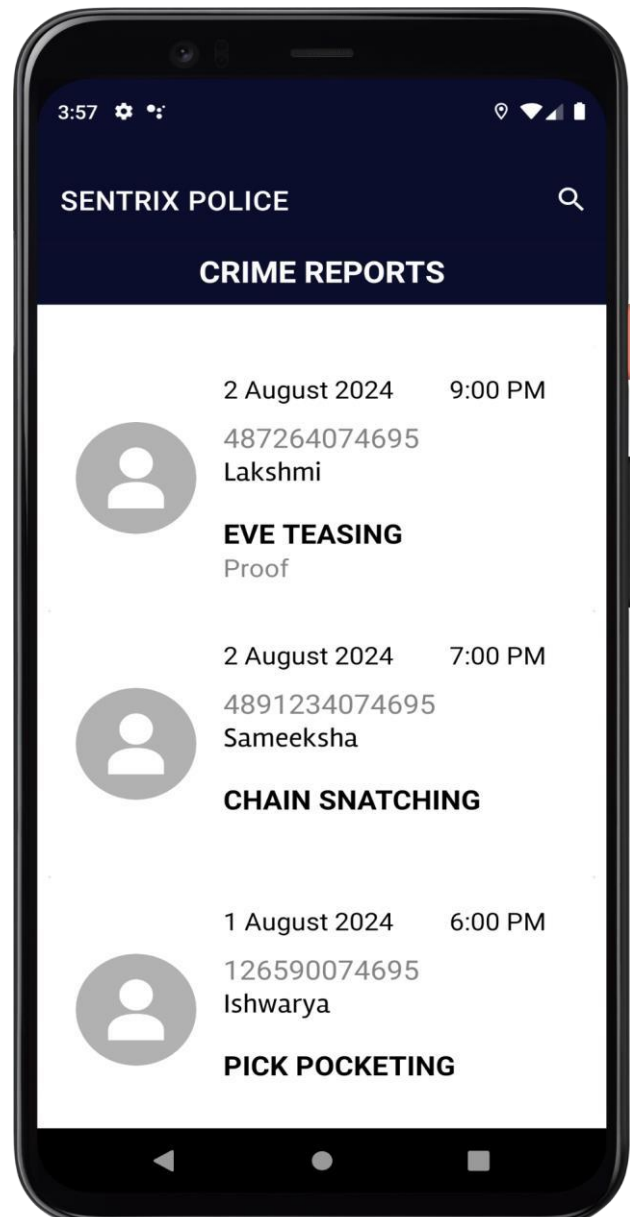
Fig 8.7 Crime Meter
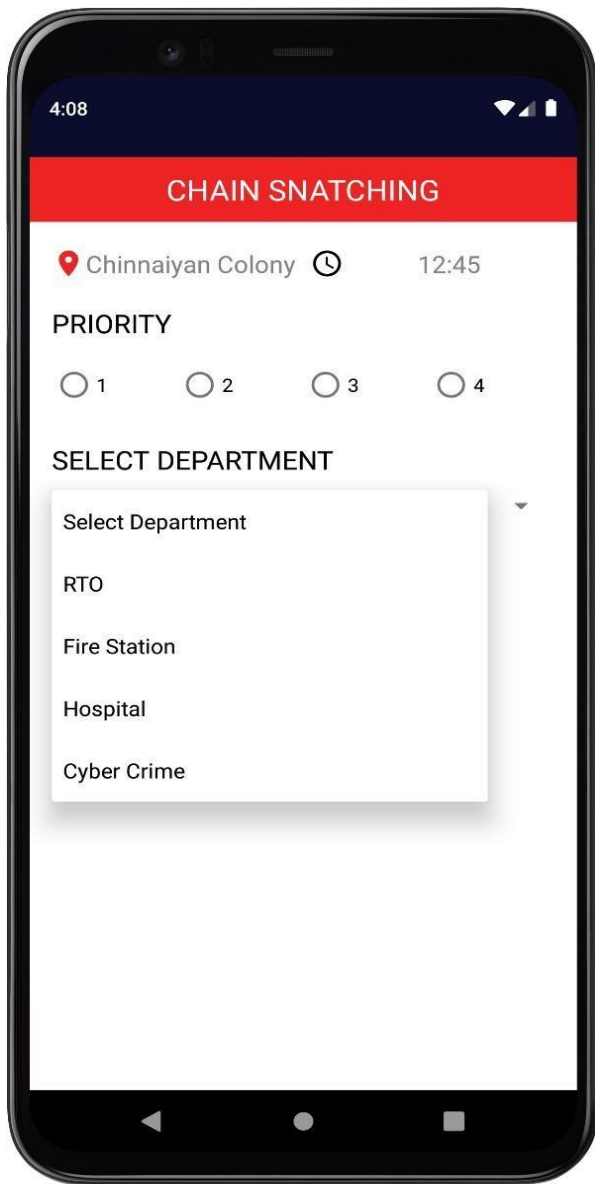

Fig 8.8 Crime Reports

Fig 8.9 Prioritize Department
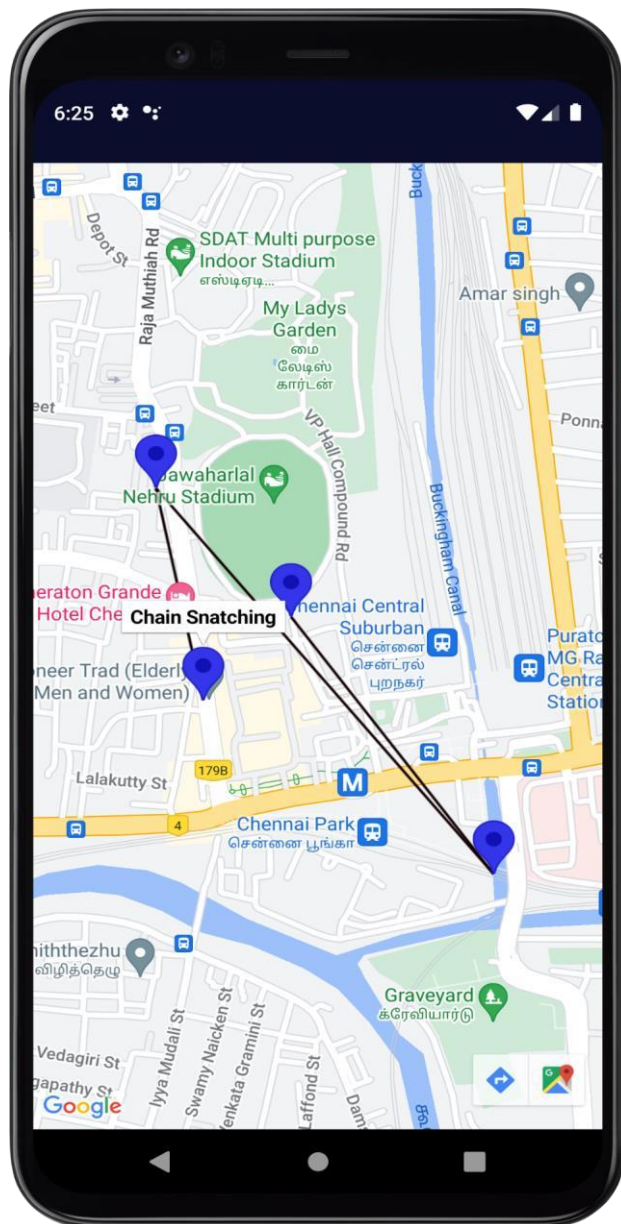

Fig 8.10 Broadcast Message

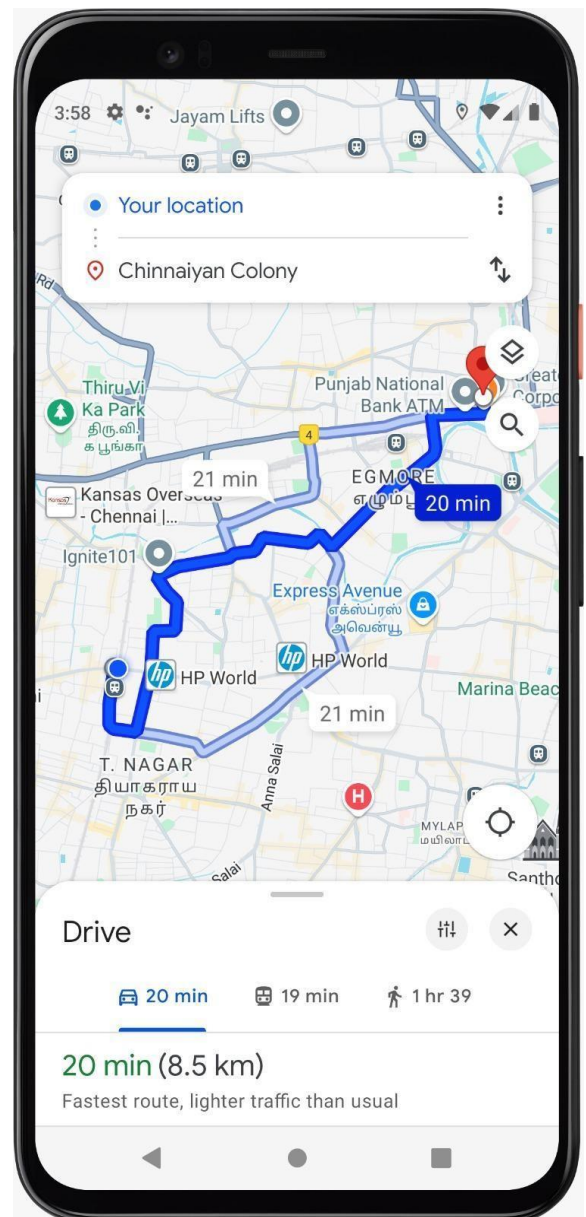**Fig 8.11 Crime Report Map**

Fig 8.12 Shortest Path Navigation

CHAPTER 9

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